Railway Age

FIRST HALF OF 1920—NO. 14 NEW YORK—APRIL 2, 1920—CHICAGO SIXTY-FIFTH YEAR

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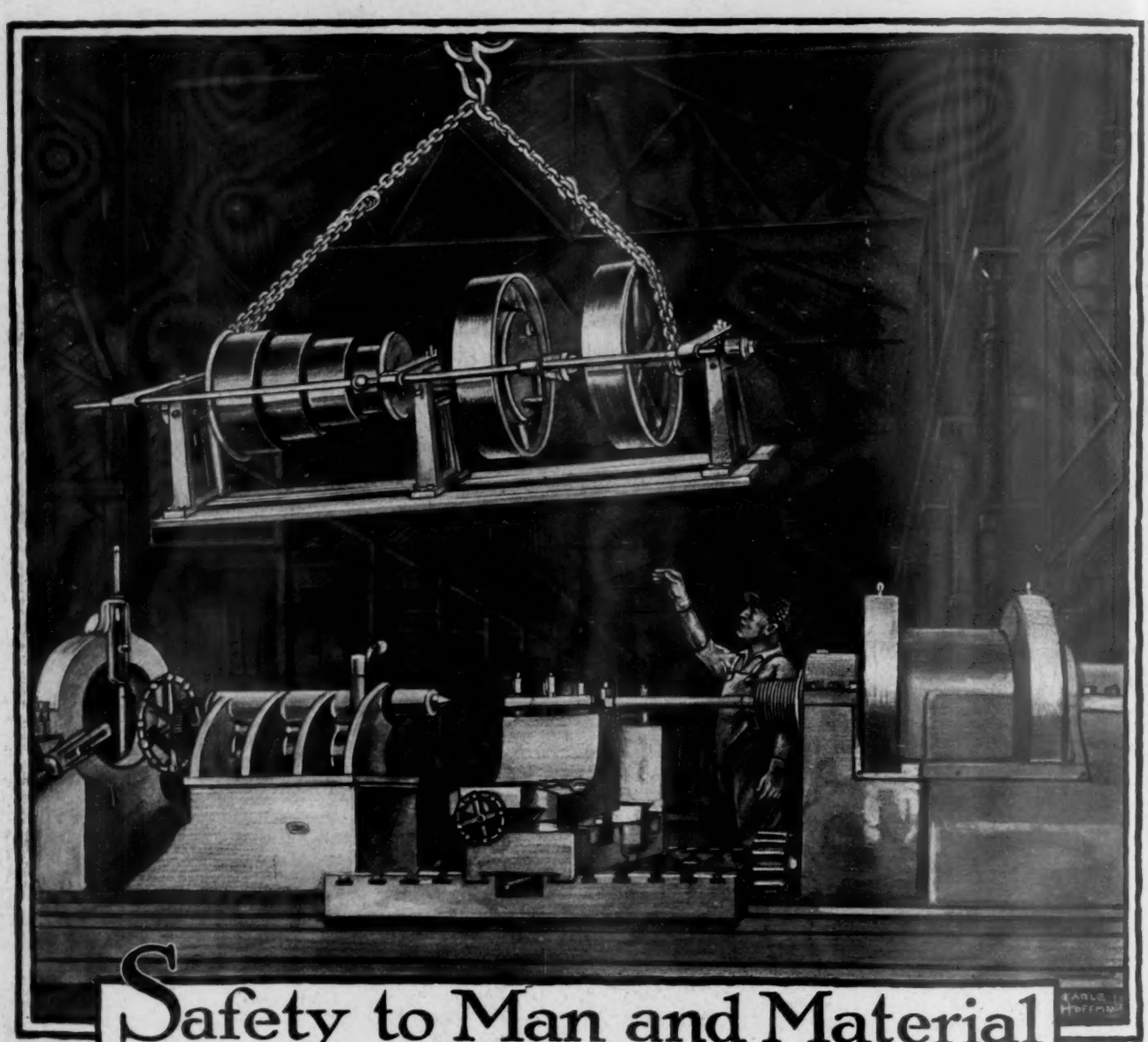

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Published weekly by Simmons-Boardman Pub. Co., Woolworth Bldg., New York, N. Y. Subscription Price, U. S. and Mexico, $5.00 a year; Canada, $6.00; foreign countries (excepting daily editions), $8.00. Entered as second-class matter, January 30, 1918, at the post office at New York, N. Y., under the act of March 3, 1879.

EDITORIAL

Railway Age

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Valuation and "Unearned Increment"

Professor Vanderblue's article, which we publish elsewhere in this issue, is a sweeping attack upon the entire current theory of railway and public utility valuation, with all its implications. That theory is that the valuation of a railway or public utility property should be based mainly upon the present cost of reproducing it and that the return allowed to be earned upon this valuation should be no larger than is necessary to enable it to escape condemnation by the courts as confiscatory. Mr. Vanderblue contends, in substance, that a valuation, if it is really value that it is desired to determine, should be based upon the "unimpaired investment to date," and that to this should be added allowances for all "intangibles" due to the development of the organization of the railway, and of its connections, traffic, etc. He repudiates the theory that railway profits should be subjected to special limitations, that the so-called "unearned increment" in railway land should be recaptured by the public. In other words, he apparently believes that since when railroads were being built and developed, investors in them were allowed to believe they would be treated much like other business concrns, there is no justification, at this late day, for adopting an entirely different policy in dealing with them, if their ownership is to be left in private hands. Whether the reader agrees with all Mr. Vanderblue's arguments and conditions, he will find his discussion interesting and forceful.

Reorganization for Efficiency

It is significant that while some railroad officers are complaining of the inefficiency of their forces, others are more or less enthusiastic about the loyalty of their subordinates and the work that is being done by them. With such conflicting reports, the question naturally arises as to the correctness of the observations or as to the nature of the local conditions which determine the quality and quantity of service rendered by the individuals. Napoleon had the rare talent of inspiring his men to a degree that made them almost superhuman in overcoming difficulties. To what extent are supervising officers deficient in the qualities of real leadership? Is it not possible that the lack of efficiency in many cases may be traced to the management rather than to the men? How many supervising officers have given any considerable amount of serious study to the art of handling men? A "boss" must possess important qualities other than the knowledge of the working details of the operations under his control; indeed officers have made good in a most decided fashion who have had very little knowledge of the details of the work of their departments, but who have had the rare ability of understanding human nature and of knowing how to inspire their men to put forth their best efforts. No matter how well fitted an executive may be with natural ability for the handling of men, he will find it necessary, if he is to secure the best results, to give much time and deep study to this question. Just as the skillful designing engineer utilizes the data that has been placed at his disposal by scientific research, so the executive must take advantage of all of the scientific investigations and studies that have been made in relation to the handling of the human element. Are you doing this?

Speed Up Car Building

The survey of the public attitude regarding the railroad question presented at the Railway Business Association dinner by George W. Simmons deserves the most careful study by all who are interested in the preservation of the present favorable sentiment toward the roads. Mr. Simmons emphasized the need for courtesy and frankness on the part of the railroad employees. The need for increased facilities for handling traffic, though not brought out so clearly, must not be overlooked. Railroad officers may well ask themselves whether they are doing all that is in their power to handle the traffic to the best advantage. The speaker illustrated forcefully the serious consequences of the present shortage of cars, yet at the present time some roads have nearly 50 per cent more cars on their line than they own and others are hampered by shortage of equipment. Would it not be advisable to use more extensive and drastic measures to secure a better distribution of the cars than is noted elsewhere in this issue, even though it would increase temporarily the mileage of empty cars handled? If the roads are to supply the equipment needed to handle in a satisfactory manner the traffic that is offered, the present deficiency in the supply of cars must be made up. It is estimated that over 700,000 new cars will be needed in the next three years. On this basis 240,000 cars should be built this year but the number ordered thus far is a very small portion of this total. The transportation needs of the country cannot be met if each road tries to shift the burden to its neighbors.

Encouragement from the Top

The recent convention of the American Railway Engineering Association was beyond question the most successful which this organization ever held. Not only was it the greatest in point of the attendance but, as stated in the address of the president, it represented the conclusion of a year of productive co-operation with the American Railroad Association through the agency of Section II—Engineering. The officers of the American Railroad Association have indicated their appreciation of the work done by the engineering association, and the latter has the satisfaction of knowing that its work is receiving the backing of the superior body. The success of the A. R. E. A. has been brought about through a correlation of the efforts of its individual members, but this has been obtained only through the co-operation of the railroads in encouraging their engineering officers to devote no inconsiderable portion of their time to association affairs. With the promise of even greater future returns from the work of this association, there is now more incentive than ever for assistance by the railroads. Some of the roads have been giving this aid unstintingly for years, while others have stood aloof. This is a matter which is strictly up to the individual managements. If they wish to have a part in this valuable work they must see to it that their officers are properly represented in the membership and on the committees. How many railway presidents have taken the trouble to ascertain whether their chief engineers and other engineering officers are members of this association? The A. R. E. A. is now making a concerted effort to increase its numbers, and the railway executives can do much to make it a success.

The Cost of Maintaining Grain Doors

ONE OF THE MOST DIFFICULT features in connection with the shipment of grain is to secure satisfactory grain door service. Unfortunately, the responsibility for the supplying and maintenance of satisfactory grain doors does not lie with the agencies most directly involved in their actual use. The doors are placed by the shipper and removed at the elevator, while the principal function of the carrier is to supply the doors and foot the bills. This inevitably leads to carelessness in the use of the doors and in seeing that they are returned when the cars are unloaded. Furthermore, it tends to encourage the use of inferior material in their construction, which results in increased liability of damage to the doors in removing them from the cars and greater probability of loss of grain in transit, thus completing the vicious circle.

One of the large grain shipping systems in the West spends from $300,000 to $500,000 a year in the maintenance of grain doors, which is equivalent approximately to a 50 per cent renewal each year. The breakage resulting from each unloading amounts to as high as 15 to 20 per cent. With the price of lumber used in grain door construction showing an increase from the pre-war price of $7 or $8 per 1,000 b. m. to $60, thus making a cost as high as $15 a car for complete equipment, the increased importance of economy in the use of grain doors is apparent.

The evils of the present situation were clearly brought out in a set of resolutions passed about a year ago by the Terminal Grain Weighmasters and a committee of the National Scalesmen's Association, in session at Milwaukee, Wis. These resolutions condemn practices of unloading which destroy the doors, when equally satisfactory results could be obtained by removing the standard sections from the top of the doorways section by section, as well as the practice of using 20-penny and larger nails to secure the doors to the door-posts. The resolutions recommend the use of not larger than 16-penny nails, and the least possible number of these. The resolutions further urge that the carriers revise their specifications for grain doors or take such steps as may be necessary to stop the growing practice of using poor, culled, rotten and other unsuitable lumber in the manufacture of the doors.

The grain shipping season is now past and the next season will not open for some months. During this time the carriers should take measures, acting through their local agents at shipping points, to secure the largest measure of co-operation from the shippers in properly fastening the doors so that they may be removed at the unloading point with the least possible damage. With the doors properly fastened, similar measures may be taken at unloading points with a reasonable hope of success in securing the careful removal and return of the doors.

Present Conditions Demand Modern Power

THE EFFECT of the increased capacity of locomotives on railroad operating cost was brought out forcefully in a recent railroad club paper. The author pointed out that from 1888 to 1917 the revenue tons per train increased from 176 to 620. During the same period the cost of coal per ton had advanced from $1.14 to $2.20, but the fuel consumption per ton-mile had been decreased one-third and the cost had increased only from $.0006 to $.0007 per ton-mile. The greatest single factor in bringing about these economies has been improved motive power. The increase in size has not been so important as the development of devices to save fuel and labor and secure increased capacity; in fact without these appliances the large modern locomotives are insufficient machines.

To some of our readers these facts may seem commonplace. The *Railway Age* has emphasized them many times in the past and the only reason for repeating them is that even today some railroad officers fail to realize their full significance. That such is the case is shown by the action of some roads in drawing up specifications for new power which specifically exclude some of the modern appliances now in general use. It is difficult to follow the reasoning of the men who consider the elimination of all special devices to be desirable. It is true that in this way a reduction in the first cost could be effected, but the first cost of a locomotive should be a secondary consideration. The costs of fuel and labor are constantly increasing and the only way to combat this increase is to increase locomotive capacity. If this is done by applying modern devices the gain in most cases is two-fold. Whatever saves fuel also increases the capacity of the power and whatever saves labor speeds up operation and increases the capacity of the road.

In 1905 there were in use locomotives which were essentially the same as those built today, except that they were not fitted with the modern appliances. These locomotives, burning 5,000 lb. of coal per hour, developed about 1,120 hp.; a modern engine at the same rate of combustion delivers 2,000 hp. Locomotives are constantly being made more efficient and the only way to take advantage of progress is to secure modern power. Some roads have ordered locomotives which are duplicates of designs built four or five years ago. Has nothing been learned in all that time that would make for improvement? Any road that overlooks the savings that can be effected by the application of modern devices is simply losing the earning power of these improvements for a time and will no doubt apply them later at an increased cost for their installation.

Progress in locomotive development is relative and the road that does not move forward is going backward. It behooves every road when buying power to capitalize the experience of the motive power department and to apply every up-to-date device that possesses real merit.

Electric Lighted Block Signals Contribute to Economical Operation

ALTHOUH THERE ARE advantages in replacing oil by electricity for the lighting of railway signals, progress in that direction has been slow. Electric lighted signals are now used on about 19 per cent of the entire automatic block signal mileage in this country. Of the roads so equipped, 12 have over 100 miles and 3 have over 500 miles electrically lighted. These installations undoubtedly include position and color light signals as well as semaphores; and it is probably true that at least 85 per cent of the electric lighted signals are on lines along which power circuits have been established for other reasons, such as for electrification or because the signals are operated by alternating current. The remainder of the signal mileage in the country, which amounts to about 81 per cent, depends upon oil or gas to furnish the night indication, although oil is generally used, especially for low voltage signal installations. Even for that type of signaling there is an appreciable mileage upon which the signals are electrically lighted, and it is in this direction that the greatest progress may be made. Recent developments in the manufacture of electric lamps, specially adapted for this class of service, makes the solution of the problem more feasible when used in connection with low-voltage batteries.

Oil-burning lamps require the attention of either a signal maintainer or a lampman every few days, and the lamps must burn continuously. But with the electric lighted signal it is possible to provide an automatic means whereby the lighting of the lamp can be controlled by the approach of the train, if

desired. This feature can be installed at a nominal cost, depending upon the type of installation, and will result in an appreciable saving in battery consumption and in an increase in the life of the lamp, which at present is designed to burn approximately 1,200 hours; in other words, if the circuits for the lamp are arranged so that it will burn continuously, its life will be approximately 50 days. On the other hand, if an approach system is installed the lamp will burn only upon the approach of a train, and its life will depend upon the occupancy of the track sections; that is, assuming 30 train movements a day, each consuming four minutes, the total occupancy of track will be two hours. Upon that basis a 1,200-hour continuous burning lamp would last 600 days.

With an electric lighted system of signals the service of the lampman, or the time it requires a maintainer to take care of the oil lamps, can be dispensed with. Of course, the electric light system requires maintenance, but nothing compared with that required by the oil. In territories where maintainers take care of the oil lights, as well as the signals, a change to electric lighting may make it possible to lengthen their territories, thereby eliminating or transferring the service of one or more such maintainers. Now that the roads have gone back to their owners, the officers are free to inaugurate and work up new plans and methods which in their judgment will contribute to economical operation; because of the constantly increasing shortage of labor the question of signal lighting other than by means of oil may find favorable consideration.

Possibilities of Raising New Capital

THE TRANSPORTATION ACT has apparently put an end, for the time being, to any hopes of financing the requirements of the railroads by the issue of additional stock. The Lackawanna or the Union Pacific might sell stock at a price above par, but they are the exceptions. The form of the law is such that new railroad securities will almost of necessity bear a fixed rate of interest. Investors are hardly likely to be willing to take stock on which the rate of dividends must of necessity be limited while there is no assurance that in a time of unusual depression or because of the failure successfully to compete with other roads in the same group dividends may not be reduced or entirely suspended.

Take a strong road like the Atchison, Topeka & Santa Fe. Assume that it runs through three rate groups in two of which it competes with the Southern Pacific and in the third with a number of other roads. Valuation will quite surely show a larger investment and "final value" for the Santa Fe than the face value of all the bonds and the par value of the stock outstanding. The same, however, will be true of the Southern Pacific. In the rate groups through which the Santa Fe runs, the rates will be fixed to allow earnings of 5½ per cent on the aggregate value of the Santa Fe, Southern Pacific and other roads—the Rock Island, etc. Under these rates the Santa Fe could pay interest charges on its bonds and something more than 6 per cent on its stock; but even if the 5½ per cent on the average for the group would permit the Atchison to earn 10 per cent on its stock, would this be incentive sufficient to induce a man to invest in Atchison stock at par? It hardly seems likely. With a pencil and paper he can figure out the maximum that he can get on this stock—10 or 11 or some other per cent—but he can feel no assurance that in the next five or ten years the Southern Pacific would not compete so successfully as to leave the Santa Fe with only three or four per cent left, after interest charges, for its stock. Reverse the assumption and the same thing applies in regard to the sale of Southern Pacific stock at par.

This is all by way of saying that the investor can no longer hope to buy railroad stock and realize a handsome profit as compensation for the risk which he has assumed. Lacking the hope of profit, he will demand a fixed charge, which, if it is not paid, gives him the privilege of placing the railroad company in the hands of receivers.

It is interesting to see what effect the passage of the railroad bill has had on the market price of railroad stocks. Of course it must be borne in mind that the stock of a company may be traded in from day to day at, say, between 80 and 90, when if $20,000,000 in new shares of that stock were to be issued it might be quite impossible to sell the stock at 75. However, one thing may fairly be assumed with safety. New stock can not be sold at a higher price than the stock already issued is being quoted at in the day-to-day trading on the exchange. As far back as January 1 students of the situation began to base their estimates on their opinions concerning the probable form of the compromise between the Cummins and the Esch bills and it will be of interest to examine prices from that time. Let us take six railroad stocks that are actively traded in but which appeal to widely different classes of investors and speculators.

The Union Pacific, a stock paying 10 per cent, represents not only the earning power of one of America's most prosperous railroads, but also large values in the securities of other companies, most of them, however, railroads. On January 2, Union Pacific sold in the neighborhood of 124. During January quotations remained at almost the same figure, but on February 6 dropped below 120; and on February 13 it was quoted at 110. The following week it went to about 118 and remained around that price until the announcement of the two favorable Supreme Court decisions.

The Atchison, Topeka & Santa Fe and the Pennsylvania Railroad are standard investment stocks. There is almost no speculative element in either, and both have been considered sound investments for widows' trust funds. Pennsylvania has a par value of 50, but, taking it on the basis of 100, i. e., giving a quotation for two shares instead of one to make it easily comparable with other stocks having a par value of 100, it sold at about the same price as Atchison on January 2—in the neighborhood of 83. The price remained about the same through January, dropped slightly in the first two weeks of February, crossing 80 on February 18, but sold up the following week to above 85; it has remained at about that price since. Atchison, selling at about the same price as Pennsylvania on January 2, dropped off gradually to about 78 on February 13, and is now selling at about 81.

New York Central has not quite the long record as an investment stock that Pennsylvania has, and the capitalization of the company consists so largely of securities bearing fixed interest charges that the stock is more speculative in character. The New York Central, however, during the two years of government operation, showed up remarkably well. In fact, in the last five years the earning power of this property has increased rapidly and has been in marked contrast to the demonstrated earning power of its competitors. On January 2 New York Central was selling a little below 70, dropped off very gradually to a little below 65 on February 13, and is now selling around 76.

Baltimore & Ohio some years ago was considered a sound investment stock. It is probably still held by a large number of persons, including many women, who are dependent for their living on their income from their investments. The earning power of the property, however, has greatly declined under conditions beyond the remedy of the management. The company continued to pay dividends even during one year when the payment had to be made from surplus. It is one of the roads which, were there no guarantee of a continuation of rentals, would be in a rather bad way. The stock would not ordinarily now be recommended by a conservative banking house as anything but a speculation. On January 2 Baltimore & Ohio was selling at about 32 and continued almost

at this level, dropping down to about 28 on February 13, from which point, however, it recovered, selling on February 27 at over 35, and is now quoted at about 34.

Erie common may be classed as wholly speculative in value. A valuation of the property may show a considerably greater "final value" than the aggregate of the many series of bonds outstanding; but, in addition to a very heavy funded debt, there is first preferred and second preferred stock, both of which precede the common. On January 2 Erie was selling at about 13, dropped down to a little under 10 on February 13, and is now selling at about 15.

The drop in railroad stocks around February 13 was in part due to general market conditions, but also probably to a fear at that time that no compromise would be reached by Congress and that the roads would be turned back to their owners on March 1 without legislation or the continuance of rentals. Since then, as we see, there have been moderate advances, but the market has shown no enthusiasm whatever. The passage of the railroad bill brings various benefits, but it cannot be said to have given any decided increase of strength to the railroad share market. While, of course, the factors affecting the stock market are so many and varied that the course of six stocks proves nothing, yet the exhibit affords corroborative evidence to back up the assertion that most railroads will find it quite impossible to finance their capital needs in the near future by the sale of additional stock.

Effect of Locomotive Counterbalancing on Stresses in Rails

BECAUSE OF THE MANY more or less indefinite, if not intangible, influences entering into the loading and support of track, its design has been less scientific than that of almost any other engineering structure. Owing to the varying conditions of support on the one hand, and of loading on the other hand, it has not been possible for engineers to design the track structure with any degree of precision approaching that of a bridge. Rather, the track has been built almost entirely by rule of thumb methods, adding more or larger ties or increasing the weight of the rail from time to time as conditions *appeared* to make it necessary.

As a result there have been those who have been of the opinion in recent years that the loading has reached the limit of safe practice, if it has not already exceeded it, and that this has been a contributing if not the primary cause of many of the recent rail failures of certain types. Unfortunately neither the proponents of this idea nor those opposing it have been able to substantiate their arguments with conclusive data. It is for this reason that particular importance attaches to the second progress report of the Joint Committee on Stresses in Track of the American Railway Engineering Association and the American Society of Civil Engineers. This report, which was abstracted in the *Railway Age* of March 5 and March 12, contains a large amount of information which forms a definite contribution to that phase of this problem relating to the effect of speeds and the counterbalancing of locomotive drivers on the stresses in the rail. As such it warrants the serious consideration of engineering and mechanical department officers.

The counterbalancing of locomotives has been a source of contention for years, the discussion being renewed with each successive wave of kinked rails. The committee points out the fact pertinently in this connection that the frequency with which kinked rails are found is an indication of the punishment which the track receives even more often at speeds not sufficient to leave such visible indications of damage.

The tests were made on tracks of the St. Louis-San Francisco and the Illinois Central, which, the committee states, were in ordinarily good condition. Santa Fe and Pacific type locomotives, taken from regular service, were employed in the tests on the Frisco, and Mikado type locomotives on the Illinois Central. The rail was of 85-lb. A. S. C. E. section in both instances.

By means of special apparatus the stresses produced in the rails by these locomotives and by their individual driving wheels were determined for various speeds, and these stresses were differentiated between those resulting from speed and those caused by the counterbalancing of the drivers. The tests with the Santa Fe type locomotive showed the maximum stress in the rail under the main driver at a speed of 50 miles an hour to be 3.75 times that at 5 miles an hour. The increase due to speed was placed at 92 per cent and the remainder was attributed to the counterbalance. The total increase in stress for a speed of 40 miles per hour was found to be 2.58 times, and for a speed of 25 miles per hour nearly double. The increase due to counterbalance alone at the latter speed was 58 per cent.

Averaging all tests for all drivers, the average increase in stress in the rails at a speed of 50 miles an hour due to speed alone was 60 per cent for the Santa Fe type locomotive, 35 per cent for the Pacific type and 50 per cent for the Mikado type. The average increases in stresses in the rail at the several drivers, due to the effect of counterbalance at the same speed, was 85 per cent for the Santa Fe type, 30 per cent for the Pacific type and 60 per cent for the Mikado type locomotive. Further, the increase in stress at the main driver was greater in each case than the average just given and was much greater with the Santa Fe type, as indicated above.

Further studies were undertaken to determine whether the stresses set up in the two rails were the same, the experience on the Frisco having given some indication that injuries were more common to rails under the left side of a locomotive than on the opposite side. The investigation showed that the sum of the stresses in the rail at the five wheels on the left side was as much as 20 per cent greater than for the right side. This excess was found to hold true for both maximum and mean stresses and for all speeds.

Another feature developed in this study was the fact that the stress at the outer edge of the base of rail was uniformly greater than that at the inner edge for all speeds at all positions of the counterweights of all the drivers, and for the higher as well as the lower stresses. The average of the stresses at the outer edge for the several wheels ranged from 20 to 50 per cent greater than at the inner edge, or from 9 to 20 per cent greater than the mean stress in the base of the rail.

While these studies have not been pursued to a final conclusion and further tests may modify some of the data given below, they have gone sufficiently far to indicate, at least in a general way, what the final results will be in certain directions. There can be no disagreement with the statement that they indicate the necessity for the most careful study of the problem of counterbalancing locomotives. The fact that the *mean* stress in the base of rails was found to be as high as 52,000 lb. per sq. in. and 10 per cent higher than this in the head should be sufficient to demonstrate the need for action now when so many new locomotives are being ordered.

Although this study offers no excuse for lightening the demand for improvements in mill practice to better the quality of the rails, it does point out the necessity for the more scientific study of the service to which they are subjected in order to reduce to the practical minimum the burden placed on them. With data regarding the effect of improper counterbalancing now available for the first time, those charged with the design of locomotives are under obligation to use this information in such a way as to reduce to the minimum the stresses in the track. The figures quoted above indicate that there is still a long distance to go.

New Coaling Station Speeds up Engine Service

Pittsburgh & Lake Erie Constructs Plant with Modern Coal, Sand, Ash and Water Facilities

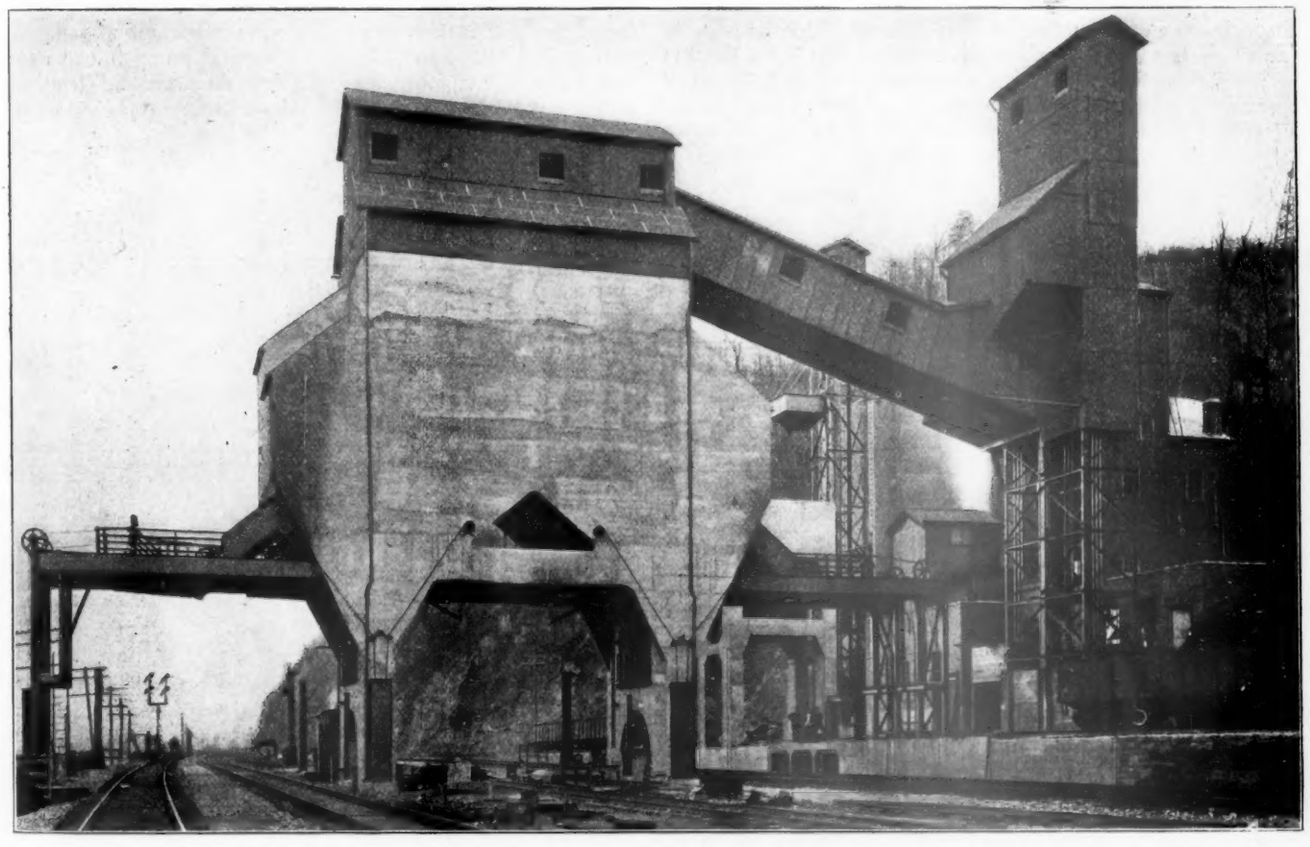
IN THE NEW 750-ton coaling station recently completed by the Pittsburgh & Lake Erie at Brightwood, Pa., about seven miles west of Pittsburgh, locomotives are given coal, sand, ashes and water service during a stop of about 20 min., with trains leaving on an estimated spacing of 10 min. This plant, which is primarily for freight service, replaces an obsolete and inadequate one located at Groveton about 1.9 mi. farther west, where the closest spacing of trains leaving the plant was about 30 min., with resultant congested traffic conditions and serious delays.

In order to facilitate the movement of trains through the station, the four-track main line of the railroad was widened through this section to permit the construction of two freight sidings with a capacity of 100 cars each, the general layout being shown in the illustration. Freight trains pulling in for service are handled on both main and siding tracks, and as the total time consumed for services is not over twice the estimated train spacing, the main line is kept free from confusion or congestion. The plant facilities in connection with the track arrangement are such that two trains in each direction, or four in all, can be given the full service simultaneously, and in addition locomotives on each of the passenger tracks can be served with coal, sand and water, although ashes cannot be handled. In operation the ashes are dropped and water delivered at one stop, while separate stops are made for coal and sand.

The coaling structure was constructed of reinforced concrete, the superstructure and other steel frame construction being covered with asbestos-covered corrugated iron, with a roof of prepared roofing materials laid on wood sheathing. The coaling pockets have a capacity for 750 tons of coal and serve all six tracks, with two chutes at each track. Coal is delivered to the plant in hopper bottom cars, which are placed on a supply track located along the hillside, and having a capacity for 10 loaded cars above the hoppers and 10 empties below. This track is on a one per cent grade and is provided with a derail and a safety track at the lower end to protect the main tracks from runaway cars.

Two hoppers are placed tandem under the supply track, which feed into two separate 2½-ton skip bucket hoists, each capable of handling 75 tons of run-of-mine coal per hour and operated by independent machinery and counterweights, etc. The two skip hoists discharge into a common hopper at the top of the elevator tower, from which the coal is fed automatically on to a large-capacity belt conveyor which carries it up an incline to the center of the coaling pocket, where it is dumped automatically. In general, only one hoist is operated at a time, the other being held in reserve, the capacity of the hoists and the pockets being sufficient to allow a 24-hr. supply of coal to be placed during the day shift.

The wet sand is delivered to the 40-car capacity storage house in hopper bottom cars, which dump into a track hopper located slightly down grade from the two coal hoppers. It is then elevated by a bucket elevator to the top of the storage

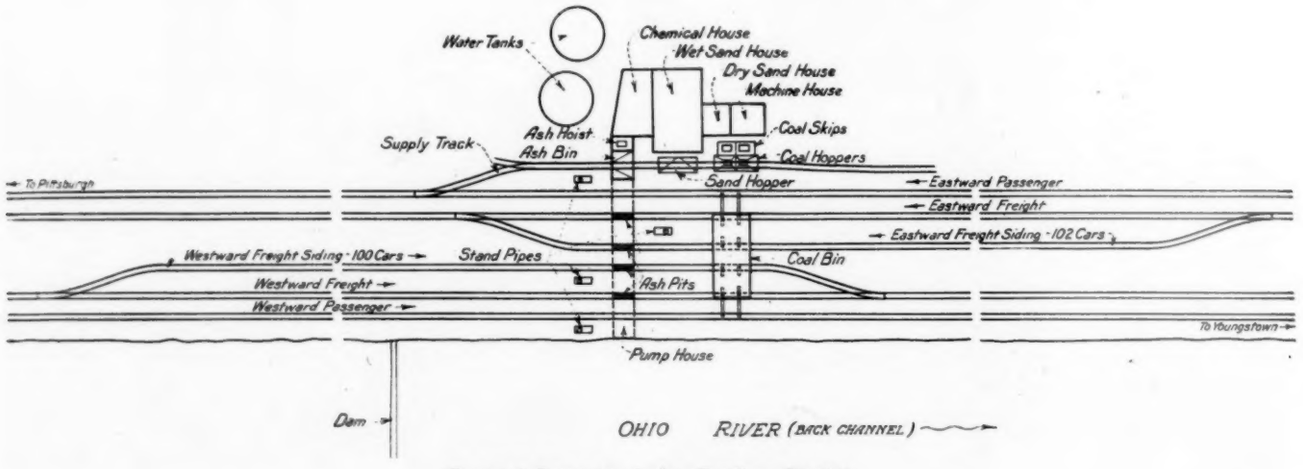


The Completed Brightwood Plant

house, where it is discharged on a belt conveyor which carries it to the center of the bin. In reclaiming the sand from the storage bin it is loaded by hand labor into a belt bucket elevator which carries it to the hoppers over the drying stove, where, after drying, it runs down over inclined screens into a bin located under the floor. From here it is fed by gravity to the "boot" of the dry sand elevator, which delivers it to another belt conveyor running to the two storage bins over the coaling pocket, each bin having a capacity of 225 cu. ft. and discharging by gravity to three of the six tracks.

The Ash Dumping and Water Facilities

Each of the two main line freight tracks on the two sidings has been provided with an ash pit 14 ft. long and having a capacity of 225 cu. ft. The passenger tracks are not equipped for this service. The ashes after being dropped from the locomotive to the pit are allowed to fall into a 75-cu. ft. motor-operated car running in a tunnel under the pit, the fall of the ashes being controlled by gates in the bottom of each pit. The arrangement is such that the ashes continue to blow until the opening is choked up, after which the gate is forced through the ashes, cutting off that portion which remains in the pit. The car is sufficiently large so that no ashes are spilled on the floor while it is being moved to the hill end of the tunnel, where it is dumped into a 90-cu. ft. skip bucket



General Layout of the Coaling Station

hoist and then moved back a required distance to clear. The operation of the hoist is entirely automatic and is electrically operated and controlled by a push button, the cycle being completed by the bucket going to the top of the elevator, where it dumps into a reinforced concrete ash bin with a capacity for two carloads, and then returns to the bottom, where it remains until the push button is again operated. In order to prevent the tunnel car from interfering with the bucket hoist when either are in operation, the two are interlocked mechanically and electrically. By this method one man can remove the ashes from the pit at the rate of 12 locomotives per hr., a feature which has permitted a reduction in labor from the two-men per shift at other plants on the road to one man, representing a saving of three men each 24 hr.

The water in the Ohio river adjacent is not suitable for boiler use without treatment, for during dry weather periods it is extremely hard and during flood times it has so much soil in suspension that it is at times unsafe to use owing to the deposit of mud on the crown sheets, which in some cases forms arches between the flues, resulting in burnt boilers. An effort was made to secure water from the gravel bed under the river bottom by using deep driven wells, but this method was abandoned on account of the large amount of salt in the water so obtained. It therefore became necessary to depend on the river water with treatment for scale-forming solids and for sedimentation of the mud and other matter in suspension. A careful study of the problem was made to determine whether a continuous or an intermittent plant should be used and whether the size of the plant should be small, thereby requiring the services of a pumper on each of the three shifts per day, or large enough to allow a pumper on one shift to pump and treat enough water for 24-hr. use, and also the kind of plant which would provide the best water, including the problem of sedimentation.

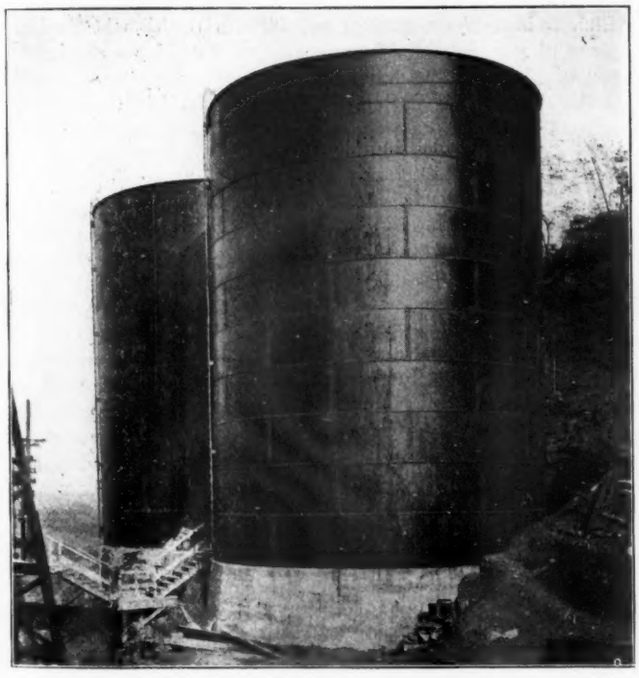
Two 350-gal. per min. triplex pumps, formerly used at Groveton, were available; these pumps working together could deliver 42,000 gal. an hr., which would permit the pumper on one eight-hour shift to furnish easily the 300,000 gal. needed for a reasonable increase in demand over the present peak load of daily consumption. The use of a continuous treating plant which would deliver the treated water into one storage tank would under these conditions not allow time for the solids to settle properly. For these and other reasons the intermittent method was adopted, and two 400,000-gal. steel tanks were provided, to be used alternately. As the water is being pumped into one tank the proper amount of soda ash and lime is forced by a separate chemical pump into the raw water pipe at the point where it enters the tank, the chemicals and the old sediment in the bottom of the tank being mixed with the incoming water by the currents formed by it. The size of the tank and the short pumping period of eight hours gives about 16 hr. for the chemical reaction and the subsequent sedimentation to take place before the water is used. While this work is going on the treated water in the other tank is being used.

At the commencement of the next pumping period the pumper operates or changes the valves, six in number, which disconnects it with the water pump and the chemical pump pipe lines. The full tank is then connected with the standpipe line and the water and the chemical pump lines are closed from it, the three lines being 16 in., 10 in. and 1½ in. in diameter, respectively. All of the valves are of the quick-operating gate type and are operated by levers attached to the stems which are extended up through the concrete covering over the valve pit. These levers are attached to the stems in the proper manner to produce the desired results at one tank, with the handle ends either all up or all down. The valves are in proper position for each tank when the three levers for one are up and the three levers for the other are down. This arrangement makes the mental problem for the pumper very simple. Water is supplied through four 12-in. standpipes, one for each passenger track and one for each of the two freight tracks. On account of the short ash pits (14

ft.), the locomotives on the freight tracks are spotted each time in the same place over the ash pits, and the standpipes are so located that the fireman can take water while the ashes are being dropped by the hostlers.

Other Miscellaneous Features

The electric current used for light and power is furnished from the company's power house at McKees Rocks, the combined horsepower of the motors and of the light load being about 200 hp. An attempt was made to secure current from an outside company, but no allowance could be secured to compensate for the short periods during which the various motors would operate. This made the minimum charge on account of the demand too high to be considered, and as an alternating current power line was being constructed over the territory involved for signal purposes, three additional power wires were installed on the signal poles for the 6,600-volt current needed for this purpose. It is estimated that the saving accomplished by using power from the company power house, after allowing liberally for its cost, will pay the cost



The Tandem Tanks for Water Service

of the power lines, which are about four miles long, and the cost of the transformers in less than three years. The continuity of the power service from this source is considered to be fully as reliable as that offered by the outside company.

Much attention was given in the design of this plant to Safety First features. All counterweights were so located and so protected that in case the supporting cables or chains should break they will not fall on the chutes or in any way harm the workmen. All stairs and walks are guarded by railings. The men are provided with comfort rooms, containing stoves, toilet facilities, wash basins, etc.

The construction of this plant was carried out under the direction and supervision of the engineering department of the Pittsburgh & Lake Erie, J. A. Atwood, chief engineer, now deceased, and A. R. Raymer, then assistant chief engineer and now chief engineer.

IT IS PLAIN the government should look into the equities of the costs, wages, materials, management, and so forth. We must have railway transportation, so we must pay the bill.—*Helena (Mont.) Record-Herald.*

Commission on Car Service

THE COMMISSION ON CAR SERVICE has sent telegrams to all the principal railroads advising them that on account of depletion of the bituminous coal stocks, particularly east of the Mississippi river, during the coal strike and the period of low production thereafter, a critical condition now exists and that it is urgently necessary that bituminous production be immediately increased and maintained above 11,000,000 tons weekly, beginning March 29. The telegram stated that "continued and concerted attention to the job by all concerned" would make this possible and still leave a fair and reasonable car supply and transportation for other commodities requiring coal cars. Coal loading lines were asked to check their performance of the past few weeks with the record attained during September and October, 1919, and to endeavor to reach and surpass those figures. Requirements of the car service rules, it was stated, may be temporarily waived when necessary to obtain more prompt handling. Last week the production was increased to approximately 10,900,000 tons.

Refrigerator Cars

Recognition of the seriousness of the refrigerator car situation was given in the telegram sent by Chairman Kendall of the Commission on Car Service to all railroads under date of March 23. He said that the railroads are confronted by a perishable crop situation which immediately and for several months to come makes imperative the most effective utilization of refrigerator cars. Demands will be continually far in excess of the available refrigerator car supply and unless otherwise advised by the commission refrigerator cars must not be loaded with other than perishable freight requiring the use of a refrigerator car. If perishable freight loading is not immediately available, such cars must be expedited empty to perishable freight loading territory in strict accordance with instructions governing from time to time.

Coal and Ore at Lake Ports

In a circular sent to the railroads it is stated that present information is that the volume of coal scheduled to move to Lake Erie ports this year and the volume of ore scheduled to move from such ports exceeds all previous records. It is, therefore, essential that all hopper or so-called heavy clearing cars of the ownership of lines serving the Lake Erie ports be assembled on these lines with the least possible delay and that these cars be confined to the lake coal and ore service to the extent necessary that the lake lines may transport to the maximum those commodities offered for movement during the coming season. To accomplish this all lines were directed to give the home movement of cars belonging to the roads serving the ports preferred attention in order that their speedy return may be expedited. In the absence of prompt loading it is directed that they should be forwarded empty without delay by the most direct route.

Grain Loading

The Commission has issued a circular providing that, effective at once, the following rules will, during periods of car shortage, govern uniformly the distribution between shippers of cars available for grain loading at stations:

1. Each shipper of grain will advise the carrier's agent each Saturday of the total quantity of grain on hand tendered for rail shipment. The ratio of the quantity so reported by each shipper to the total quantity reported by all shippers shall be the percentage basis for the distribution of available cars at that station during the ensuing week for grain loading.

2. Each shipper of grain shall make written order on the carrier's agent for cars wanted for grain loading, showing the following information:

A. Date of order.

B. Number of cars wanted (in units of 40-ton cars) and whether for sacked or bulk grain.
C. Destinations.
D. Date wanted to load.
E. Quantity of each kind of grain on hand and conveniently located for prompt loading tendered for rail shipment.
F. Name of shipper.

Copies of orders by a shipper located on more than one carrier (steam, electric, or water) shall be filed with the agent of each carrier. Such combined orders must not exceed the total grain conveniently located for prompt loading tendered for shipment.

3. Cars will not be furnished in excess of a shipper's ability to load and ship promptly.

4. When a shipper's pro-rata share of the available car supply is a fraction of a car, the fraction will be carried to his credit, and he will be entitled to car supply on the basis of the aggregate of such fractional credits.

5. The term "prompt loading," as used in these rules, is intended to mean that a car placed for loading not later than 10 a. m. must be loaded and billing instructions tendered before the close of the day on which it is placed, failing which, such car will be charged against the shipper's allotment as an additional empty for each succeeding day held for loading, or for billing instructions.

Stock Cars

The following rules will, effective at once, govern with respect to distribution of stock cars on all railroads:

1. The distribution of privately owned stock cars as between railroads and as between stations on each railroad will be authorized by the owners of such cars.

2. Such privately owned stock cars as are placed for loading by direction of the owner shall count against the daily allotment of cars to the shipper.

3. The owners of so-called private stock cars will give distribution to all their equipment before calling upon the railroads for assistance in filling orders for stock cars for their shippers or for their account.

4. If the number of privately owned stock cars placed for a shipper equals or exceeds that shipper's pro rata share of the available supply, he shall not be entitled in addition to any railroad-owned stock cars.

5. If the number of privately owned stock cars placed for a shipper is less than his pro rata share based on his daily ability to load and ship, he is entitled to be allotted railroad-owned equipment in addition thereto to make up his pro rata share.

6. The railroad will distribute available railroad-owned stock cars on a pro rata basis which shall take into consideration the ability of the shipper to load and ship.

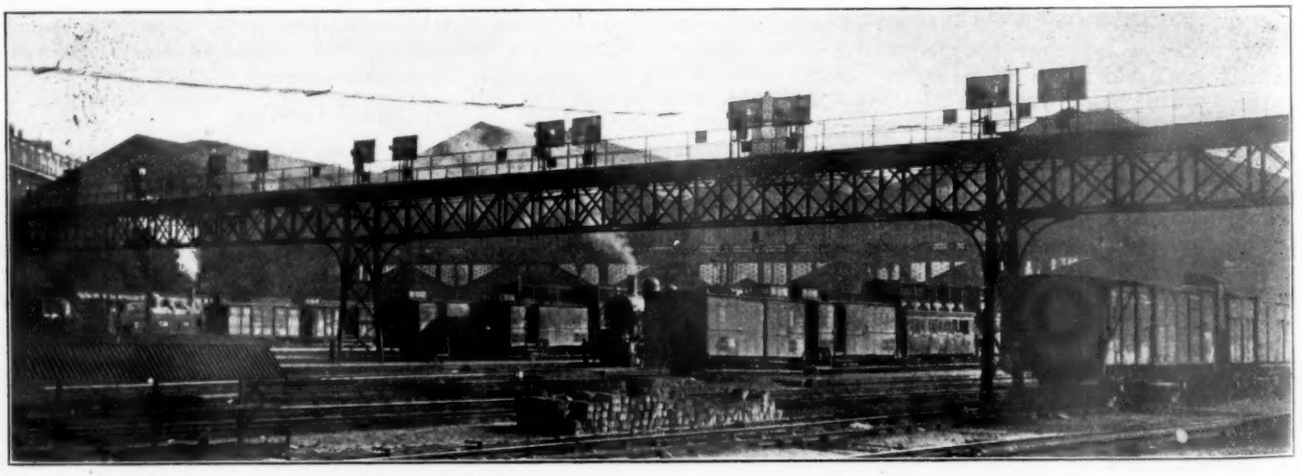
A circular has also been issued giving instructions for changing the reporting marks on the freight cars bought by the Railroad Administration which were temporarily handled under a general equipment trust and lettered G. E. T., pending their allocation to the railroads. All of the cars have now been allocated.

Car Shortage Propaganda

The Commission on Car Service has recently received an interesting illustration of the way a car shortage is sometimes magnified by propaganda conducted among shippers and consignees. A lumber company having a salt sales department has sent a form letter to its customers expressing its regret that it has not been able to ship the car of salt ordered because "the car shortage is the worst by far that we have ever experienced." The company says it has large stocks of salt which it is anxious to ship and is in a position to load out orders at the rate of 35 carloads per day if the equipment is furnished it. The customers, therefore, are urged to write a letter to the Car Service Section, mailing it in the envelope enclosed for that purpose, stating how long they have been waiting for the shipment of their particular order and how badly they are in need of salt. "And," the letter continues, "if your town is short do not fail to make mention of that fact. In other words, make your case as strong as you can, *and ask that a car be furnished us for the loading of your particular order.* We will certainly appreciate your co-operation in this matter and if you can secure a car we will make immediate shipment of your salt."

This is in effect a request for preferential car supply and the Commission on Car Service has already received 70 letters in the envelopes sent out by the company asking that cars be furnished it. The commission is also in possession of the form letter because one of the customers did not take the trouble to write its own letter but merely passed along the form letter with a notation asking that the request be complied with.

THE PROBLEM TO BE FACED, after March 1, is one of wages and rates. There will be a request for rates that will enable the railroads to live, to improve and to expand. Shippers admit the necessity of a revision upward.—*Amsterdam (N. Y.) Recorder.*



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The Gare de L'Ouest at Paris During the Strike

Annual Dinner of Railway Business Association.

Note of Optimism for Future of Railroads Under Transportation Act Feature of Meeting

PROBABLY THE MOST INTERESTING feature of the annual meeting and banquet of the Railway Business Association held at the Waldorf-Astoria Hotel on Wednesday of this week was the optimistic feeling expressed that the railroads would fare far better under the terms of the new Transportation Act than they had in the past. Combined with this was a feeling of congratulation concerning the work that the association had done in connection with the bill and an appreciation of the task that had been carried out by Senator Cummins and Representative Esch.

These thoughts were carried out not only in the eight resolutions passed by the meeting, but also in the speeches at the banquet in the evening.

The latter was attended by some 1,500 to 1,700 members and their guests, including the leaders of the railway and railway supply fields. It was presided over by Alba B. Johnson, president of the association, and the speakers included Frederick J. Koster, of San Francisco, president of the California Barrel Company; George W. Simmons, of St. Louis, vice-president of the Simmons Hardware Company, and Joseph S. Frelinghuysen, United States Senator from New Jersey.

Mr. Koster spoke on the subject of "American Destiny" and pointed out that the public was on trial almost as much as the railroads, for it is only through a favorable and interested public opinion that the best results can be worked out.

Mr. Simmons spoke on the subject of "A Continent Marking Time." He has only recently returned from Siberia where he has been engaged in Red Cross work. He showed how the primary reason for the downfall of the Kolchak government was due to the failure of the Trans-Siberian Railway. Speaking at greater length on our own railroads, he told about a questionnaire his company had worked out through its corps of 500 to 600 salesmen on the transportation question which showed a very favorable feeling for the railroads and especially a desire on the part of the public in most parts of the country to help in any way that would secure improved service. He also made some pointed suggestions as to what steps the railroad managers should take to keep and encourage favorable public sentiment.

Senator Frelinghuysen spoke on the subject of "Partners in Prosperity." He paid a splendid tribute to George A. Post, past president of the Railway Business Association, and to Senator Cummins and Mr. Esch. He then spoke of some of the underlying essentials of the new Transportation Act and showed how the railway situation should be considerably helped in the future by the favorable public opinion that has shown its results in the act.

Abstracts of their papers follow:

American Destiny

By Frederick J. Koster,
President, California Barrel Co.

This great organization, the Railway Business Association, at whose invitation we are here gathered, has for its objective bringing about a fuller understanding of what is today, perhaps, and I know not but that at all times during the past generation it has been, the most vital concern of every American citizen—that of maintaining at the highest point of efficiency the great arterial system of commerce, the railways of our country. Their proper maintenance is an indispensable factor in our well-being and progress and vitally affects in its minutest phases, the life of each and everyone of our people. Our manner of dealing with them through government attitude and act is now to be the major test of the soundness of the very substance of our American institutions.

This great gathering has for its purpose the serious consideration of the big question of the restoration of the railroads of America. * * *

It is our personal business to do our part in developing an understanding on the part of our people, generally, of what the maintenance of these great vital agencies means to themselves directly.

We cannot look to the railway managers—we must not look to the Railway Business Association, our hosts. They do their best work by bringing us together and laying the problem before us—by awakening us to an appreciation of our own interest. But we can individually, and through our organizations—Chambers of Commerce, Traffic Bureaus, and our many agencies—arouse that interest and understanding which shall result in favorable legislation, a favorable attitude on the part of regulating bodies; awaken investors, and generally create that atmosphere of public opinion which shall result in attracting the necessary capital to enable these arterial systems of our material life to function and not only serve existing needs, but, as they were in the past, to become again the very pioneer element in our further growth.

Can anyone name a single enterprise that is not dependent upon the healthy condition of the railroad systems of our country, in one way or another, for its own continuity—not to say its very existence? All production is limited by the capacity of transportation. Let us make it clear to ourselves that what exertion we put forward toward the restoration of the railroads of America is less our service to them than it is meeting our own necessity and thus best serving ourselves. * * *

Our People Are on Trial

It is not, as we hear it generally discussed, that the railways are under trial as to whether or not private ownership shall continue, but it is we who represent the practical leadership of America who are under trial as to how we shall influence the public attitude, so that this one great step in the direction of destroying our whole national character shall not be taken.

It is the people of America who are under trial. It is their representative agency of government—the Interstate Commerce Commission—that is under test.

It is true that the managers of the great transportation systems are not freed from a large measure of responsibility, but, after all, the great test is of the leadership of American business life and its power so to influence public attitudes that we shall not again be subjected to the dangers of taking that one biggest step in contravention of the very essence of our institutions, public ownership and operation of these, the most necessary instrumentalities of commerce, and so vital to the every-day life of each and everyone of our citizens.

Nothing so directly and vitally affects business as do the acts of Legislators, of governing bodies. We have concerned ourselves far too much with the correction of apparent evils, overlooking the tremendous values that have been created, the immense forward movement of our nation and the part therein played by these pioneers of progress—the American Railway Systems.

We have lived through a veritable orgy of interference and regulation resulting in repression, retardation and almost in paralysis.

And what an opportunity there is today for a revival of the

pioneer spirit—the spirit of burning your bridges behind you—boldly and fearlessly moving toward necessary fields of endeavor.

Transportation as it exists today is by no means in a fixed and definitely established condition, and the field for intensive as well as extensive pioneering in transportation, opens wide before us. I believe that what in substance is demanded is that there shall be no checking of elasticity, that enterprise shall not be retarded, and that such a degree of regulation only shall be imposed as will prevent discrimination of that which is definitely destructive of the public interest. We, as a people, must substitute by every possible exercise of true leadership the courageous forward-going pioneer attitude for that of making our main consideration watchfulness lest there might be some transgression. * * *

What an indictment of our own neglect of our leadership duties it is that a condition should prevail in this great pioneer land giving us the problem of the restoration of the railroads! And I believe that we business men of America have provided the major contributing cause resulting in their present condition, through our constant selfish attacks upon them, our short-sighted policy of continuously fighting for reductions of rates and special consideration—thereby justifying, if not, in fact, stimulating, the hostile attitude of the public generally and of legislators; particularly to the end that the major concern of legislative bodies became that of control and regulation in greater and greater detail.

We cannot absolve the railway managers from all blame because they too failed, as most of us have failed, to exert ourselves in the direction of guidance in the development of a sound public attitude.

A Continent Marking Time

By G. W. Simmons,
Vice-President, Simmons Hardware Co.

As your chairman has said, I am comparatively recently back in the hardware business after some two and a half years in Red Cross service, including considerable spent in France and more lately in Russia.

I am so "chock-full" of interesting experiences in that wonderful but afflicted country that I feel sure I could interest you far more if I might talk of Russia than by presuming to advise on one of the greatest, if not the most vital, of all of our domestic national questions. In the short time I shall speak I will refer to but a few of the striking facts about Russia which seem to have a bearing on the subject of our discussion tonight—transportation. . . .

Today the great powers of the world are trying to feed the Russian people through the Bolshevik forces, which is evidently a difficult, if not impossible, task. For at least a year and a half, commencing in the summer of 1918, this could have been easily accomplished by the extension, not of military aid, but of economic assistance to the people of Russia through the honest all-Siberian government. Had such action been taken, as urged by practically all Americans on the ground, it is my belief that the spread of Bolshevik power would have been largely prevented.

Russia had plenty of food for its entire 180,000,000 population last year, but it was not properly distributed, and literally millions died of starvation, while comparatively a short distance away from them was food a-plenty; but no transportation existed to bring the food to the starving. . . .

Failure of Trans-Siberian Primary Cause of Russian Downfall

The primary cause of the downfall of the Kolchak government—the only real force opposed to Bolshevism—was the failure of that great artery stretching some 6,000 miles from the Pacific across into Europe and known as the Trans-Siberian Railroad. When this railroad functioned the people fared comparatively well. When regular train service had almost been suspended things began to go to pieces. It was at that time that I traveled in a special train for ten weeks covering some 12,000 miles and had an opportunity—probably not afforded to any other American—to see almost every phase of the Russian question and particularly the stagnation and chaos which resulted directly from the lack of transportation. Even our own renowned engineer, John F. Stevens of Panama Canal fame, at the head of the Inter-Allied Railroad Commission, was unable to keep the Trans-Siberian Railroad in operation. It is to me no surprise that the Kolchak army should disintegrate when I realize that there were last winter about 150,000 cases of typhus fever in his army of some 600,000 and that much of the scanty supplies obtained in the East failed to reach him at the fighting front in Western Siberia. With no drugs, no hospitals, no clothing, no manufactured articles of any kind, no factories in all of Siberia and no help from the outside world, it is small wonder to me that Kolchak's army was destroyed. With it went all hopes of an early overthrow of Bolshevism.

It may seem a far cry from Russia to America or to compare the Russian railroad with the American railroad, yet only a few short years ago Schenectady locomotives and American Car & Foundry box cars and gondolas were running about as well on the Trans-Siberian Railroad as on any of our American railroads. Considering the service it was called upon to perform, the Trans-Siberian compared creditably with a great many American roads; yet in only a few years of neglect, with little or no upkeep, repairs, maintenance or renewals, it broke down entirely. And with the stoppage of this great artery went the life of that magnificent country—endowed by nature with unlimited resources and riches upon the soil and under the soil, which, if transportation were available, could in a few years create new wealth sufficient to reconstruct all of Europe; but without transportation these resources are today about as worthless as the sands of the Sahara desert.

Desire for Service Dates Back to Beginning

When my father started in the hardware business in St. Louis there were no railroads west of the Mississippi river. Boats on the Missouri river and the now-extinct canvas prairie schooner carried our merchandise beyond the rain belt, as they called that part of the world now known as Kansas.

With the building of the great Western trunk lines came such prosperity and development that communities vied with each other in offering inducements to the pioneer railroad builders to construct a line through their particular settlement. They wanted railroad service and were willing to pay almost any price to get it.

I recently made a careful inquiry throughout the country to ascertain how nearly we are today in a similar condition. I wondered whether the many parts of the country which are today suffering from inadequate transportation service would be ready to do as our forefathers did and make the personal effort and sacrifice to get that service as did the early settlers in our western country. I refer not so much to those vast stretches of arable land not now near enough to a railroad to be cultivated at a profit, but particularly to those cities and agricultural communities through which pass the rails of our great railroad systems. I wondered to what extent our people realize that the conflict between the public and the railroads during the past decade is directly responsible for the lack of locomotives and freight cars to haul to market crops raised by the sweat of the brow of the American farmer. . . .

Salesmen Keep Company Informed on Economic Developments

The company with which I am associated has over 500 traveling salesmen, covering practically every county in the United States, each of whom makes his territory every two or

four weeks, and hence comes to know it intimately. Before we send our salesmen out we teach them that it is highly important for them to be able to learn intelligently and accurately to read the sentiment of their territory on any great question or to report the actual condition of business or crops in their particular territory whenever we call for it. We must make all of our plans for securing merchandise six months or more in advance. We cannot afford to guess on business which it is possible to forecast. The hardware and general stores in the small towns and villages are the centers of gossip, so to speak, of the men of the community. When the farmer comes to town he visits the hardware store, while his wife sells her butter and eggs or purchases her dry goods. Our salesmen are instructed not only to cultivate that farmer when they meet in the store but also to explain to the merchant himself just what information they are going to ask him for on the next trip, so that he can talk with his customers when they come in and hence have the accurate information.

Opinions from Various States

We first adopted this method in the summer of 1896 after Bryan had been nominated on the "free silver platform." Thirty-one days before the election these reports from our salesmen were tabulated and enabled us to predict the exact electoral vote. With the positive knowledge that the gold standard would be maintained, we bought everything in sight and placed orders to run us on a big volume for a year ahead. Since 1896 we have been able to to forecast all presidential elections, and in mast cases to forecast the electoral vote as we did in 1896. I asked our salesmen to report on March 6 on a number of questions. These questions, together with a canvass of the answers, I will present to you in a moment. First let me read you a number of general statements selected from the reports.

Indiana

"People generally seem to think present rates ought to bring sufficient revenue to have the roads economically operated. In my presence, a railroad employee said that four men were holding positions in the same capacity and had a hard fight to find enough work to keep them out of mischief. He said that all he did was to sit in a comfortable chair, smoking good cigars and draw $264 per month from the public. The remedy is to discharge three of these men, who can easily find employment elsewhere, and give the $264 man enough to keep him busy, which, in the case of this particular man, he would be glad to get. He wants to be busy. When the workers realize they must produce something, these questions will largely adjust themselves."

Louisiana

"Louisiana needs more efficient service, and the people are willing to pay for it if they can get courteous ticket agents, clean stations, sanitary toilets in trains and stations, and trains swept when not occupied by passengers."

Minnesota

"Most people are opposed to increased rates, believing private ownership should produce economies sufficient to relieve present conditions. Railroads now have three men to one job, each idle about two-thirds of the time. Before government control, the C. & N. W. ran freight trains from Winona to Waseca—100 miles in eight hours. Under government 'mismanagement' the division was cut in half—Winona to Rochester (50 miles) in the same eight hours."

Nebraska

"Most people have not given the railroad question much thought. When I discuss it with them, practically everybody agrees we must have better railroad facilities and must expect to pay higher rates. Many farmers now have wheat and corn to market, but no cars to move it. I feel that there will be many 'kicks' on advanced rates until people actually see improved service."

Illinois

"Re-grade idlers now drawing big wages for a few hours per day; pay employees on merit system; restore old-time courtesy, and people will stand by the railroads."

Arkansas, Texas and Idaho

"Railroad train crews squander time in order to draw overtime pay. They do not care whether freight or passengers ever get over the line. Railroad management might offer a bonus to crews for efficiency and minimum amount of claims."

Maine

"The only people not in favor of returning railroads to owners are army and navy men, who rode at one cent per mile under government operation. People generally desire more efficient transportation."

North Carolina

"Many people still indifferent to railroad question, but beginning to think about it. Those who have thought about it are ready to pay higher rates for decent service. Years ago the Southern Railway was in politics and created many enemies, but in recent years gained thousands of friends by boosting the south. Most people comment on how good this service was as compared to present government operation."

Tennessee

"In my part of Tennessee, people generally look on railroads as something apart from them, and know little of railroad operation or finances. They do not realize how dependent they are on railroad transportation. Of course, I do not refer to business men, but believe people generally are not interested in railroad investment."

Montana

"Traveling men boast of how many orders they took and the extra town they made that day. Railroad employees boast of how few hours they actually worked the day before and for which they drew eight hours' pay. People around here are sick and tired of that kind of slackers."

The Questionnaire

The questionnaire is as follows:

Question 1. Do the people in your section generally approve of the return of the railroads to private operation?

The answer is almost 100 per cent yes.

Question 2. Are people willing that the railroads should have a "square deal" by which their revenues may be increased in proportion to their advanced expenses?

Question 3. Do the people desire first of all — efficient transportation service?

Question 4. Are they willing to pay what this service is fairly worth, as determined by the Interstate Commerce Commission?

Question 5. Are they willing to have freight rates advanced in order that the railways may be able to render efficient service?

Yes greatly predominates. The people are willing to grant a square deal, but there is some difference of opinion as to what a square deal really is. Many people feel that railroad rates are now sufficiently high to produce the required revenue if railroad operation is made as efficient as it was before 1914. These expressions are representative of general insistence on the part of the public that the railroads shall produce through economies at least a part of the increased income to meet the necessary requirements. The people generally will accept the decision of the Interstate Commrce Commission as to what adequate service is fairly worth.

Great emphasis is laid on the question of service, in many instances to the extent of "service at any price—but give us service."

In several sections merchants and business men favor rate advances, but have not yet taken the steps to convert the general public to this idea. In almost every part of the country exists the decided opposition to any further increase in wages of railroad employees. This sentiment results largely form the experience of the public in seeing the amount of loafing and waste on the part of railroad employees under government administration.

Question 6. Do the people generally realize that the railroads need immense amounts of money to put them in physical condition to render good transportation service?

About two-thirds of the replies are in the affirmative and

one-third in the negative. A few replies indicate that it will be necessary for the railroads to keep the public constantly and fully informed as to the broken-down condition—whether inherited from pre-war or war conditions—which it is their superhuman task to remedy. Here again a number of answers, particularly from the Middle West, indicate that the merchants and other business men realize the facts but have not as yet converted the man in the street and the farmer.

Increasing Investment by Public Will Require Comprehensive Work

Question 7. Realizing that railroad capital has not increased in recent years and numbers of cars and locomotives and all other equipment are far below the amount required to render efficient service to the public, are people in your section willing to buy railroad securities—bonds or stocks—to help the railroads thus secure funds for equipment and other capital expenditures?

The majority of replies indicate that to increase the number of people investing in railroad securities will involve skilful and comprehensive work on the part of railway managers and financiers. It will be for them to convince many citizens that changes in railroad methods and managements on the one hand, and improvement in governmental regulation on the other, are actual and of such character that the people are warranted in looking with greater confidence to railroad issues. It would be advantageous to emphasize early and late that the creation of railroad capitalization is now under the central control of the federal government and that not one share of stock or other security can be issued without government sanction. It would help immensely if the general public could be constantly reminded that the so-called "high finance deals" which have been so severely criticized are things of the past and can now never recur.

In many southern states the "noes," almost 100 per cent, indicate how fruitful a field lies before us in cultivating an appreciation of southern transportation needs and southern dependence upon railway investment in meeting these needs. There is plenty of money in the South. In no part of the continental United States does there remain so much to be done in the opening up of rich resources as in the South. Yet you just heard me read a report from Tennessee, a state sorely in need of new mileage, but its people unconvinced that investment in the instrumentality *of their own prosperity* is necessary, or, if necessary, a matter *for them* to attend to. Local crop conditions are clearly reflected in the sentiment on this question. Railroad financiers like other wholesalers seeking the market must recognize the fluctuating ability and desire to purchase as local crop and other conditions bring investable income to the various sections of the country. In the South and West people are not at all familiar with railroad securities, and often have a hazy idea of the difference between stocks and bonds. The demonstration that the railroads are being properly and efficiently managed under present private management will go far to enlighten and convince them. The Eastern financier can improve his own knowledge of America at the same time he is extending the market for his securities by educating buyers in those sections which have hitherto not bought such securities.

Question 8. Do the people generally recognize that efficient transportation, even at considerable increased cost to shippers, will produce more net profit for users of transportation?

Again the "yes" is in majority—about two to one—which is an exceedingly promising sign. In Indiana 100 per cent of the replies are "yes," while in Texas about 65 per cent are "yes," and in Tennessee about 35 per cent. The realization of the value of efficient service to business seems strongest in the northern sections of the country and weakest in the South.

The Problem Before the Railroad Manager

The managers of the railroads today are confronted with an exceedingly difficult problem. If they handle it successfully they may confidently count upon a continuance and strengthening of the present greatly improved public sentiment toward them both by the wider distribution of railway securities and by sedulous dissemination of the fact that the railroads are not to be financial footballs for Wall street speculators. A vast number of people in the United States, either as owners of railway securities or otherwise, will be confirmed in a sympathetic attitude.

In closing, may I make some concrete suggestions—first to the operating officers and directors of railroads?

Reduce your forces to normal. If you cut out surplus employees and tell the public the plain, unvarnished facts, the public will be behind you solidly.

Insist on a full day's work for a full day's pay *in the name of all the people* who pay your revenue and who will stand by you if you refuse to permit agitators to continue decreasing the efficiency of the individual worker.

Operate passenger trains on time and restore pre-war courtesy of your employees and their recognition of the rights of the public. This will go far toward encouraging the public in an attitude of patient forbearance toward your great task, for which time is inevitably required. A great improvement in punctuality of passenger trains is already noticeable.

Avoid short-sighted mistakes of some railroad managements who are now refusing cars for loading off their line. While this will eventually be necessary, such action immediately after the return to private control is very dangerous under present conditions. It will likely result in the Interstate Commerce Commission requiring exchange of equipment, as under government operation. Railroad managements should accept this condition as a result of government's failure to build sufficient equipment during the last two years. Do not irritate the public in this way and produce results far worse in the long run than any road will suffer from liberal interchange regulations.

Avoid short-sighted mistakes which irritate people beyond any possible benefit to be accomplished; I refer to such policies as some railroad managements are now following in refusing cars for loading when consigned off their line.

Let the Public Know

Above all, not only give the public a square deal but let the public know you are doing so. Put all your cards on the table. Make it clearly understood that you cannot restore normal service immediately. Thus you will gain the patient tolerance of a public which is prone to expect the impossible.

Do not hesitate to tell the public plainly that practically every railroad office was unionized since the government took control and that merit has not been the measure of promotion; that you have been forced to give the next man in line the job in any vacancy, whether he was fitted for it or not.

Let the public know that you recognize that all extra and needless expense in railroad operation eventually comes out of the pockets of the people as a whole—the vast army of consumers who in the last analysis pay not only the freight but all the pyramid of increased cost.

Remember that private operation is on trial. If you now make good the people will willingly pay whatever rates and provide whatever capital may be needed. If you cannot now make good the Plumb plan or some other form of government ownership is inescapable, in which case "Good bye, America."

But as a business man I also have a concrete suggestion for business men, farmers and all other users of transportation.

The Cummins-Esch act has transferred from the carrier to the Interstate Commerce Commission the responsibility for initiating adjustment of railroad revenue to public needs, whereas in the past the railroads have appealed to the public

for help to convince the Interstate Commerce Commission of their needs. This function under new conditions is also transferred. It now rests with the *users of transportation* and the *consumers* of things transported to study their own transportation needs and the cost of meeting them, and then to *volunteer to the commission their idea of adequacy.*

We have been, all of us in the several communities, too prone to concern ourselves with getting all we could out of the transportation plant and organization as it existed. For the future let us perfect our own organization by providing systematic mechanism and personnel for the looking ahead, and let us co-operate with the railway managers and financiers so that transportation once more, as in the former period, will anticipate rather than lag tardily behind traffic needs.

We Must Overcome Public Indifference

In Russia I saw Bolshevism as an unrestrained engine of destruction. In America I have seen destructive criticism of Bolshevism ineffective because we have been too busy to offer something better in its place. We must profit by the frightful experience of Russia, where chaos followed the breakdown of transportation facilities, and find some better way to refute the lies and false promises of Bolshevik propaganada, even more than by denunciation of it. We must offer to the American workmen and American people generally something constructive, something American and something that will appeal to them as better to tie up to than the illogical propaganda of radical agitators.

We must overcome the indifference of our citizens to these great questions. We must teach them that Americanism means constructive progress for the benefit of all classes of our American people; that class favoritism must cease, regardless of whether the favored class is of laborers, of capitalists, of farmers or of any other part of the whole. Particularly must our representatives in municipal, state and national legislative bodies understand that they cannot hold their offices unless they at all times stand for the entire people or against any group of the people.

Our war requirements gave us an interesting but dangerous experiment with state socialism and government control of transportation. We have emerged under a new law which places the transportation industry on a safe basis. Let us not now forget one of the greatest lessons which the war has taught us—the duty of every individual citizen to do his full share of the nation's work. Let us not drift back into our previous selfish attitude of being so busy with our own individual interests and so busy criticising others that we have forgotten our own individual responsibility. Let us continue to emphasize the necessity that every real American shall work for his nation on the reconstruction program as he worked for his nation on the war program. To do less would brand us as unwilling to assume the obligations which always have and always must accompany the privileges of American citizenship.

Partners in Prosperity

By Joseph S. Frelinghuysen,
U. S. Senator for New Jersey.

Upon the wall yonder, you have caused to be blazoned a quotation from the Transportation Act of 1920.

"The commission * * * * shall give due consideration, among other things, to the transportation needs of the country and the necessity (under honest, efficient and economical management of existing transportation facilities) of enlarging such facilities in order to provide the people of the United States with adequate transportation."

The passage is a rule of adequate return. As everyone knows, the feature of the legislation was accepted by the House of Representatives not at the outset but at the end. Acceptance of that rule by the House was made possible by the most impressive manifestation of public opinion, and I desire to say here and now, as a member of the Congress which framed that Act, that I know of no group of men who with regard to that rule were clearer in their heads, more steadfast in their purpose, more indefatigable in their labors or more influential in making and registering opinion, than the members of the Association whose guest I am tonight, under the remarkable leadership of its distinguished President, Alba B. Johnson.

A Tribute to George A. Post

While it would be entirely out of place for me to catalogue the numerous representatives of the world of transportation who aided Congress in its great work of shaping the Cummins-Esch Act, I cannot well omit a reference to a former president of this association who was a conspicuous factor in this notable achievement. In the manifold duties which I had as a member of the Military Affairs and Banking and Currency Committees, I was loath to undertake any new ones, and the modest part that I have had in this legislation was due to the spur of inspiration given me by my neighbor, my friend and comrade, George A. Post, for nine years president of this association. He came to Washington and not only drafted me, but commanded me to do my small part in the effort to help Senator Cummins bear the great burden which had fallen upon his shoulders.

To the advice and counsel he gave me he brought not only his great wealth of experience but also the conclusions of the great committee which was formed to study this problem at the instance of the National Chamber of Commerce, known as the National Transportation Conference.

Whenever Mr. Post appeared and to whomsoever he spoke upon the railroad subject, he was impressive, persuasive, persevering and effective and the Chamber of Commerce of the United States has had in him as Chairman of its Railroad Committee a man broad in view, patient, discreet, and a faithful representative of the great commercial interests of our country.

These conclusions of the National Transportation Conference were finally drafted in the concrete form which was commonly known as the Chamber of Commerce Bill, introduced by me. Many of the provisions of this measure were incorporated and absorbed in the Transportation Act of 1920 as finally enacted.

My earliest interest in railroads was that of a business man whose duties required him to seek safe and legitimate opportunities for the investment of the surplus funds of several of our great fire insurance companies. At that time, quite naturally perhaps, my chief concern was that the transportation systems in which were invested the enormous reserves which protected the property and welfare of thousands of policy-holders should be managed and operated in an efficient manner, permitted to earn a fair return, and regulated with a spirit of tolerance.

Too long did we treat the greatest and most capably operated transportation system possessed by any country on the face of the globe as an undeserving mendicant. The wonder is that we have reaped incredibly better than we have sown.

In my opinion the man who deserves the greatest credit for the broad and effective treatment of this subject, for the embodiment of various fundamental provisions in legislative form, and for the prophetic vision which made possible this progressive enactment, is none other than Senator Cummins. * * * * Though I did not have the same intimate association with Chairman Esch of the House Committee on Interstate and Foreign Commerce that I did with Chairman Cummins, I am familiar with the extraordinary service which he performed in the consummation of this

monumental legislative project, and I know that no public servant ever displayed greater zeal, or labored with a more acute regard for the public welfare.

As a member of the Committee presided over by Senator Cummins, I was soon precipitated, together with my colleagues, into the midst of the whirling vortex of bills and schemes designed to solve the railroad problem. It was then that I paused to get my bearings and to reflect upon what had gone before.

I recalled the history of early railroad pioneering in this country, with its magic conquest of sand-swept deserts, its invasion of virgin forests, and the reclamation of trackless wastes, accompanied, as it was, with hardship, privation and danger, against which only the energy, enterprise, and daring of the Stalwart American railroader could prevail.

"Thou Shalt Not"

I remembered, also, the less pleasing side of the story, when legislators were less scrupulous than they are now, before the public conscience and consciousness were aroused and when, ofttimes, the carriers deemed it necessary to resort to questionable methods, long since abandoned, I am happy to say. This era marked the darkest days of railway development, when rebates and preferences were conferred secretly upon powerful auxiliaries; when the speculator was accused too often with justice, of satisfying his greed by taking stock bonuses larger than were actually needed to float the bonds; when extensive flotation commissions were enacted by grasping bankers who took advantage of a narrowed money market to squeeze the carriers, who were compelled to resort to them for credit. Is it any wonder that the worm turned, or that the pendulum swung far the other way?

I recalled the early rumblings of popular discontent aroused by real and fancied wrongs committed by the railroads, soon followed by state legislation, ofttimes well intentioned for public protection, but also ofttimes oppressive, retaliatory, and improperly creative of selfish advantage to the individual State, while unjust to other States and prejudicial to the general welfare.

The conclusion could not be escaped that, no matter how remiss the railroads themselves might have been in the matter of honesty and fair-dealing, the statesman's role in connection with the upbuilding of the railway system of the United States had become almost that of an executioner. Personifying the admonition "Thou Shalt Not," the legislator had blocked progress as effectively as he had checked wrongdoing. Thousands of miles of fertile domain lay awaiting only the advent of the railroad to spring into productivity to help feed and clothe the people. Time and again factories, mines, and shops had closed down, entailing widespread unemployment and misery, for lack of cars in which to transport their products. Wasteful grades remained unleveled, urgently needed bridges and terminals remained unbuilt, and antiquated equipment remained unreplaced. The one answer of the legislator and the public service commissioner was "Thou Shalt Not." So long had their lips been attuned to that refrain, so long had they been accustomed to repress and restrain, that it had never seriously occurred to them that there existed a limit beyond which further repression and restraint spelled stagnation and disaster, not for the railroads alone, but for the entire country as well.

I do not wish to enter a general indictment of all former laws and orders concerning railroads. For years it corrected certain evils and abuses.

The Cullom and Hepburn Acts were remarkable pieces of legislation, and some splendid results have followed their enactment. To the extent that failure ensued, the fault was not due to any impotence or incompetence on the part of the Interstate Commerce Commission, but to that state of the public mind which displayed avowed hostility to adequate protection of the interests of the railroads, and to the narrow vision of Congress which, until recently, failed to grasp the magnitude of the problem and the necessity of handling it in a catholic, generous spirit.

A Constructive Measure, Committee's Objective

It was in the light of knowledge gained from sad experience, and from this broader viewpoint, that the Senate Interstate Commerce Committee entered upon its work of preparing a proper transportation bill. A constructive rather than a destructive measure was our primary objective.

In the course of the hearings which followed, many distinct plans for solving the railroad problem were presented. Though many of them were obviously unfeasible, they all possessed the merit of dealing with the problem in a fundamental manner. The temporizing attitude seemed to have vanished. Everyone appeared to recognize that heroic measures were necessary in order to restore the credit and efficiency of our railroad systems.

It would have been easy, of course, for Congress to provide simply for hurling the railroads back at their owners without regard for what might happen to them. But such action would have spelled disaster for the railroads, and consequent chaos and incalculable injury for the public. Instead, we saw the necessity of providing, and did provide, for compensating the non-contract carriers, reimbursing the short-lines for losses incurred by them while their neighbors were under Federal control, funding the indebtedness of the carriers to the United States, the continuation of existing rates for six months, a federal guaranty of railway operating income to all railroads for the same period, and a $300,000,000 revolving fund out of which loans at 6 per cent interest may be made to the railroads.

The provisions respecting the rates and permitted earnings of railroads, finally agreed upon are, in my opinion, the most important and far-reaching in the entire statute. They represent the greatest step forward in railroad regulation since the passage of the original Act to Regulate Commerce in 1887.

Stated abruptly, the provision for diverting the excess returns of prosperous railroads sounds rather appalling. Constitutional lawyers will argue that the more flourishing carriers have a property right in a rule of rate-making which has always favored the more fortunately situated carriers, and that the value of their securities is based on the application of this long-standing rule, hence that it is a violation of the Fifth Amendment of the Federal Constitution to change the rule and perhaps undermine the value of the railway stock.

On the other hand, it can be argued that absolute necessity renders it imperative that a rule of rate-making evolved under one set of conditions should not stand in the way of progress —nay, even of national self-preservation—when an entirely new set of conditions exists. The old rule of rate-making was not prescribed as a safeguard for the carrier; it grew out of the old hostile attitude towards the railroads. To say that a common carrier has a constitutional right to continue exacting and keeping rates which give it an unfairly high return is to state that Congress is powerless to remedy an insufferable condition.

Our transportation system stands in a very intimate relation to our government organization, and to all intents and purposes must be considered part and parcel thereof. The rights of the individual stockholder or of the corporation itself must be subordinated to those of the public generally. Thus, every railroad, however small, is, relatively speaking, as much of a public utility as a great trunk line, and must be protected and developed as a part of a great national system, whose component elements maintain a state of correlation and interdependence which few would admit 20 years ago.

Government's Attitude Should Restore Confidence

Let us say that the thing about the railroads which Congress had to correct was the impairment of credit; not only this, but to show that the government's attitude should in the future restore confidence on the part not merely of the lender's but on the investor's part, who could feel safe as a partner in the enterprise.

Under conditions as they were before the war, it was difficult to sell railway bonds and almost impossible to sell railroad stock. The question upon which you might ask my judgment is whether the new legislation does strengthen railway credit, whether it will be easier now than formerly, money market conditions being equal, to sell bonds and possible to sell stock.

While neither a lawyer or a banker, my answer is: unquestionably, yes. To argue to the contrary is to write the Interstate Commerce Commission down as a body which has learned nothing by the experience of the last few years, incapable of broadened views and incompetent to administer the laws of Congress intended to be more liberal than any previous legislation. Such is not my conception of that body. Though lacking power to do certain things in the past, they are now clothed with power, well-nigh plenary, and to them I feel that we can look confidently for the exercise of wise judgment and liberal construction of the new law, enacted with the purpose of dealing with the railroads constructively and not repressively.

A few days ago—March 22—the commission gave a hearing on the territorial grouping and basis of valuation for purposes of rate-making. No one in attendance upon that occasion could have heard one member after another frame questions to witnesses without reaching the conclusion that the seven commissioners then and there present had accepted in good faith the governmental purpose as determined by Congress and dedicated himself in good faith to its full accomplishment. Commissioner McChord, who had been frankly out of sympathy with that purpose before its enactment, volunteered an explicit recognition of the facts and the official obligations which have been created by the law of 1920.

As a business man carrying fiduciary responsibilities, I say to the railway managers and to the financiers, Congress has done its part, the commission will do its part, see to it that you do yours, attacking your great problem with courage and energy, and showing always to the public an eager desire to be an efficient and an obliging servant. Be confident. Once the American government gives its pledge it does not welch.

To individuals in every walk of life I say, you are partners in prosperity; acquit you then like partners. You will share in the benefits. Do then your share, not thinking only of interest and dividends but thinking a great deal about the transportation service which can be given only by well-financed railways and of the national well-being which can only be ours if transportation be adequate.

Our railroad systems have been the nation's pathfinders and pathmakers.

A Revival of the Old Spirit of Progress

With efficient, economical management on the part of the railroad officials, with the approval of the public, with the active and vigorous support of the Interstate Commerce Commission and all others in authority, with the loyal co-operation of the railroad emlpoyees and with the financial backing (which, under existing conditions, should be extended to the fullest degree) of the great body of investors, there can be no question of a complete revival of the spirit of expansion and development which formerly dominated our vast railroad systems.

The government has its hands on one of our fundamental institutions—the steam railways. This industry, for it is an industry, a big industry, creating and sustaining all other vital activities in our national life, is less free to expand, because, unlike the factory, workshop, store or other private concern, the government actively regulates and controls its operations, its revenues and its disbursements.

Regulation is necessarily inherent in the business. But insofar as freedom is consistent with the character of public utility, we are now to invite the finest ability in the nation to come into transportation as investors, as directors, as managers, as employees of every grade, as developers of improvements in mechanism and methods. And we must see to it that government, in the exercise of the power it has assumed, shall be the big brother, alert not only to guide but to strengthen.

The fact that so many constructive, upbuilding provisions could be put through both houses of the federal legislature and incorporated in this epoch-making measure is a significant commentary on the change that has come in men's minds. The old repressive attitude has largely disappeared. Keen appreciation of the fact that a country can grow and expand no faster than its railroads, that any deterioration in its trensportation system means a proportionate strangling of its prosperity, and that neglect or oppression of the railroads means national retrogression, has slowly but surely pervaded the popular consciousness.

Resolutions

At its business meeting the association passed the following resolutions giving its ideas on the more recent developments in railway matters:

(1) We offer the Sixty-Sixth Congress grateful acknowledgment for its services to the republic in correcting defects in railway regulation. Congress has made it the law of the land that railways built and operated by citizens shall be regulated by the government with the aim that they shall thrive and grow. From this Act, Americans may hope for more adequate transportation and hence more vigorous agriculture, industry and trade. They are also encouraged by this inspiring proof of American capacity in crises to believe that political reliance upon individual self-development in every field of human activity is not to perish from the earth.

(2) We hail with satisfaction the view of their new duty disclosed in utterances by members of the Interstate Commerce Commission. They accept the Transportation Act as a mandate to make private ownership and operation prevail if possible and to do so by initiating immediately and continuously the adjustment of rates to a basis of railway income which will adequately enlarge the plant. That purpose has overwhelming public approval. The function which it imposes upon the Commission has now for the first time the quality of statutory power and duty. The future course of the Commission should be met by all concerned in a spirit of co-operation.

(3) New duties of the Interstate Commerce Commission demand a high order of quality and equipment for their adequate performance. The added duty to sustain and construct as well as to regulate, is, under the new law placed upon the Commission. We urge the President to nominate as Commissioners men of positive force who are known to be in sympathy with the purpose of the Transportation Act.

(4) We welcome the many manifestations of a broader public attitude affecting transportation. The user is coming to recognize this facility as a part of his own plant—a utility co-operatively established and maintained, and serviceable only so long as all concerned work in harmonious foresight. We counsel business organizations which include traffic in their scope to establish relations between appropriate agencies of their own and of the carriers for the determination of improvements and for estimate of their cost. This will enable each community and its instrumentality to acquaint the Interstate Commerce Commission with facts and views upon

which it may judge the needs of the community in respect to railway capital, income and revenue. It will also facilitate activity for stimulating the requisite investment by railway users and citizens as such. Especially encouraging is the disposition, shown throughout the Union, to be patient and forebearing toward the railway managers in their struggle out of confusion to normal.

We observe with satisfaction the energy and courage of the railway managers in beginning the task of reconstruction. Stability is assured only if the users of transportation are reasonably content. Public contentment requires service as good as possible and as cheap as is consistent with excellence, and that the managers continuously and frankly discuss with the public their plans, their difficulties and their need of co-operation.

(6) We urge the public to bear constantly in mind that revenue rate adjustments under the Act of 1920 are to be initiated by the Commission. For two years they are to yield an income per cent prescribed by law. After two years they are to yield income sufficient for an explicit purpose. That purpose is adequate enlargement of the plant by investment of private capital. It is for the Commission to estimate service needs and their cost, the going rate for new railway capital, and the revenue required, and if they are so minded, to call upon the carriers for tariffs to accomplish the results. The public interest is now paramount and the public agency carries the public responsibility.

Officers were elected for the ensuing years as follows: President, Alba B. Johnson; honorary vice-president, Geo. A. Post; vice-presidents, Robert F. Carr, A. L. Humphrey, G. W. Simmons, W. W. Salmon, W. W. Willits, Knox Taylor, and W. H. Woodin. M. S. Clayton has been re-elected treasurer and Frank W. Noxon, secretary.

Distribution of I. C. C. Accident Bulletins

By William S. Wollner

ATTENTION was recently called in Congress to the tremendous waste involved in the printing of millions of documents annually by the government printing office, but a very small portion of which serve any useful purpose. It is stated that the worst offender during 1918 and 1919 was the United States Railroad Administration. This raises the question whether printed matter issued by the government which should be of value to railroad men is being properly availed of.

For some years the Interstate Commerce Commission has been issuing its quarterly accident bulletins containing statistics of railroad accidents and the reports of investigations of accidents made by the commission's inspectors. While the statistics in these bulletins are interesting to the analyst and the executive officer, the portions detailing the investigation of accidents contain instructive material that should be made available to the operating officers and employees so that they may learn to avoid the occurrence of accidents through the experience of those who have erred.

A railroad with about 500 miles of track and 2,500 employees had purchased 20 copies of these bulletins as issued, sending them to the division superintendents for distribution, but at the beginning of the present year plans were adopted for a wider and more effective distribution of them than had been secured theretofore. Bulletin No. 70 containing statistics for the entire year 1918, as well as statistics for the last three months thereof, was received from the government printing office in January. Although the figures contained therein were something over a year old, those referring to grade crossing accidents were abstracted and included in a news bulletin which was released to the papers published in this road's territory. Two copies of the I. C. C. bulletin were then sent to each engineman and trainman member of safety committees, accompanied by a personal letter from the officer in charge of safety, calling attention to lessons that could be learned from reading the investigations detailed in the bulletin and requesting that the recipient immediately hand one of the bulletins to a fellow employee who he believed would profit by reading its contents, retaining the second copy for his own perusal, which also should be handed to some other employee when he had finished reading it. A card was attached to each bulletin bearing on one side the name and address of the officer in charge of safety to whom it was to be returned, and on the other side the brief statement, "I have today handed Accident Bulletin No. 70 to ———," with a space for signature. The man to whom the bulletins were sent was requested to drop this card in the railroad mail when the bulletin was passed to a fellow employee.

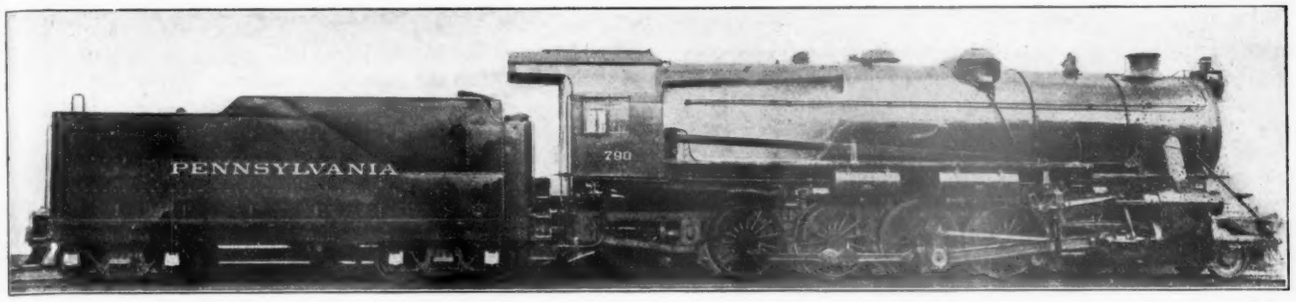
As soon as one of these cards was received, the officer in charge of safety wrote a personal letter to the man to whom the bulletin had been handed explaining to him, in turn, the benefit the contents of the bulletin might be to him and asking him also to pass the bulletin to a fellow employee when it had served his purpose. A notification card as described above was inclosed in this letter. The success of this plan in getting wider distribution of the bulletin than was formerly possible is shown by the fact that by the middle of March one of these bulletins had been passed to the fifth man, and six had each been passed to the third man.

Accident Bulletin No. 71, containing statistics for the first three months of 1919, was received from the government printing office at the same time as was Bulletin No. 70, but immediate distribution was withheld so that the following plan could be put into effect:

When a safety committee member to whom two copies of Bulletin No 70 had been sent advised by means of the cards that had been furnished him that both bulletins had been passed to fellow employees, a copy of Bulletin No. 71 was sent him, together with a letter from the officer in charge of safety thanking him for his interest in the distribution of Bulletin No. 70, calling his attention to matters of interest in Bulletin No. 71 and asking him to follow the same procedure with Bulletin No. 71 as he had used with Bulletin No. 70. This plan was also followed where the employee to whom Bulletin No. 70 had been handed by a fellow employee reported that he had passed it to a colleague. In each case a personal letter accompanied the bulletin, together with a card to be returned when the bulletin was passed along. Up to the middle of March three of these bulletins had passed to the third parties and seven to the second parties.

The figures given above show the success of numerical distribution, but that this plan of distribution has also worked out more successfully from the educational viewpoint than the former method has been shown by the contents of these bulletins being discussed in conductors' rooms, in enginehouses and at safety and fuel meetings. Incidentally, it formed a means for the railroad management to show its desire to co-operate closely with its employees in the solution of problems mutually affecting them.

THE RAILROAD PROBLEM is the people's problem, because the people must have transportation proportionate to their needs and at reasonable cost. Our commerce about equals the present carrying capacity of the railroad; the carriers cannot increase their facilities because of inadequate revenues and consequent demoralized credit; the nation's industry and commerce cannot grow beyond the carrier's capacity or ability to serve. With industrial advantages and commercial opportunities greater than ever before shall the West stand still? That's the problem of the hour and it's the people's problem.—*Cheyenne (Wyo.) Leader.*



Pennsylvania Decapod, Type I1s

Pennsylvania Decapod Develops 3,500 Horsepower

Restricted Cut-Off Effects Remarkable Savings in Fuel— Hand and Stoker Firing Compared

IN 1916 the Pennsylvania Railroad built a locomotive of the 2-10-0 type with cylinders working at a maximum cut-off of 50 per cent. This locomotive with minor alterations was adopted for heavy freight service and a large number of the clas I1s, as this type is designated, are now in use. The design of this locomotive was described in the *Railway Age* for June 15, 1917, page 1241. Details of the performance as disclosed by the results of test plant trials,

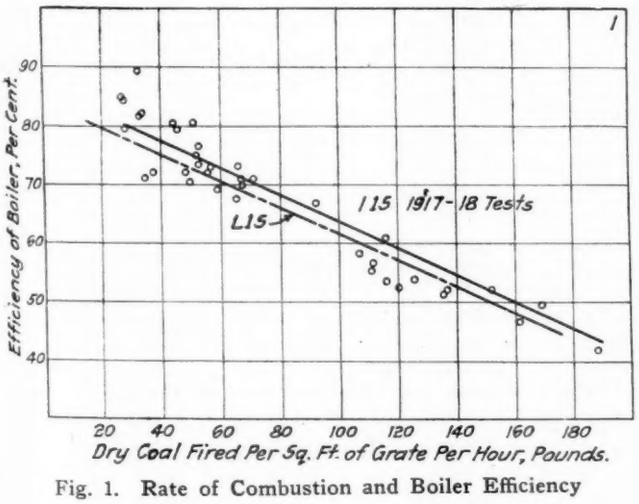


Fig. 1. Rate of Combustion and Boiler Efficiency

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In discussing the considerations which led to the development of the I1s the bulletin points out that many locomotives, in helping service especially, are worked almost continuously with a cut-off near the end of the stroke. If they were designed so as to work at but 50 per cent cut-off when in full gear, without a sacrifice of drawbar pull, there would be gained the difference between the coal and water rates at full stroke cut-off and those at half stroke, or a saving of approximately 25 per cent. The locomotive needed at a number of points on the Pennsylvania was one having a drawbar pull 25 per cent greater than that of the class L1s, Mikado type, or one having a pull of about 75,000 lb. at 10 miles an hour. A study of such a locomotive, with a limited or restricted cut-off in a two-cylinder arrangement, indicated that the desired result could be obtained with a half stroke maximum cut-off, giving a turning moment diagram very similar to that of locomotives cutting off at full stroke.

For the purpose of developing a practical means of obtaining the economies above outlined, a locomotive was built and placed on the locomotive testing plant before going into road service, as the innovations in design made it especially desirable to have complete test results before building additional ones. As a result of the tests and the general performance of the locomotive in service, certain alterations were found advisable.

Description of the Locomotive

Locomotive No. 790, as finally arranged for these tests, is of the Decapod or 2-10-0 type with two cylinders 30½ in. in diameter and having a stroke of 32 in. The boiler pressure is 250 lb. per sq. in. and the maximum cut-off is limited to approximately 50 per cent of the stroke. In many particulars the design follows closely that of the class Lls, Mikado type, which preceded it.

The table following shows how the locomotive compares with the class L1s in certain leading dimensions. The total heating surface is about 12 per cent larger than that of the class L1s, and the total weight about 16 per cent greater. The grate areas of the two locomotives are alike.

GENERAL DIMENSIONS OF LOCOMOTIVES OF THE I1s AND L1s CLASSES

	Class I1s 790	Class L1s 1,752	Increase of I1s over L1s, per cent
Weight in working order, total pounds..	371,800	320,700	15.9
Weight on drivers, working order, pounds	342,050	240,200	42.4
Driving wheels, diameter, inches	62	62	...
Cylinders (simple), inches	30½ by 32	27 by 30	37.6 Vol.
Heating surface, tubes (water side), sq. ft.	4,043.94	3,715.71	8.8
Heating surface, firebox (including arch tubes), sq. ft.	290.20	301.51	3.8 Dec.
Heating surface, superheater (fireside), sq. ft.	1,478.91	1,171.63*	26.2
Heating surface, total (based on water-side of tubes), includ. superh., sq. ft.	5,810.25	5,188.85	12.0
Heating surface, total (based on fireside of tubes), including superheater, sq. ft.	5,423.12	4,847.72	11.9
Grate area, sq. ft.	70.0	70.0	0.0
Boiler pressure, pounds per square inch.	250.0	205.0	22.0
Valves	12-in. piston	12-in. piston	...
Valve motion, type	Walschaert	Walschaert	...
Firebox, type	wide, Belpaire	wide, Belpaire	...
Tubes, number	244	237	...
Tubes (outside diameter), inches	2.25	2.25	...
Flues (for superheater), number	48	40	...
Flues (outside diameter), inches	5.5	5.5	...
Tubes and flues, length, inches	228.32	228.51	...

*This is the heating surface of the 17-ft. superheater. The standard length superheater for the L1s is now the same as for the I1s or 18 ft., with a heating surface of 1,234.65 sq. ft., but the 17-ft. superheater was used in the L1s tests herein reported. The I1s superheater surface is about 20 per cent larger than that of the 18-ft. superheater for the L1s.

Tractive Force

In calculating the maximum tractive force of this locomotive the mean effective pressure reaching the drawbar

cannot be taken as the usual 85 per cent of the boiler pressure, because of the limitation of the cut-off. Indicator diagrams, made in road service, at starting in full gear, show an average m.e.p. of about 75 per cent of the rated 250 lb. boiler pressure, or somewhat more, according to the time in which the first revolution is made, controlling the amount of steam passing through the auxiliary port. With 30½-in. by 32-in. cylinders, the calculated maximum tractive force may, therefore, be assumed to be that based on 75 per cent of the boiler pressure, or 90,000 lb. The ratio of weight on drivers to this calculated tractive force is 3.8. After the first few revolutions, it is expected that the drawbar pull will fall to that due to about 70 per cent of boiler pressure as m.e.p., or 84,000 lb., with a ratio of 4.07.

Boiler

The boiler is similar in design to the boiler of the class Lls, but the boiler tube surface and superheating surface are both somewhat larger. The superheater has 48 elements, where the class Lls has 40. The length of tubes and superheater flues, 19 ft., is the same as in the class Lls locomotive.

The details of the cylinders, ports and valves were described in the article referred to above. It may be well to mention that the valves have a travel of six inches in full gear and to obtain a short cut-off with this long travel, it was necessary to make the steam lap two inches. Full gear cut-off with six-inch valve travel is at 50 per cent of the stroke; however, to distinguish tests in full gear cut-off at slow speed, with allowance for steam passing through the auxiliary ports, such tests are marked 55 per cent cut-off as

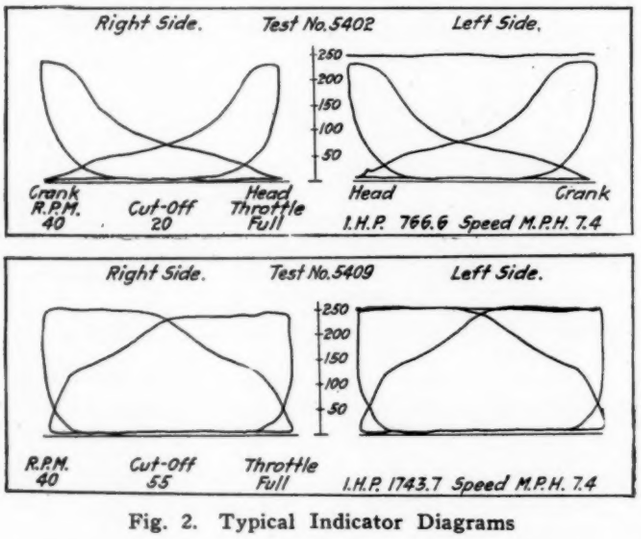

Fig. 2. Typical Indicator Diagrams

determined from the indicator diagrams. The lead of the valves in full gear is 3/16 in. The exhaust lap is ⅛ in.

Auxiliary ports are cut in the valve cages, 1¾ in. in advance of each of the main steam ports, and are intended to assist in starting; however, they are in action at all times when the locomotive is moving under steam. The ports are ⅛ in. by 1½ in., with a steam lap of ¼ in., and are located at each end of each cylinder at the bottom of the valve cage or bushing, making four ports in all.

Coal

Over 70 tests were made to develop the performance of the locomotive, and of these tests 39 were fired by hand with run-of-mine coal. In the 1917 tests Jamison coal was used, but on account of the difficulty in getting this coal in 1918, the tests were made with Crows Nest coal. These two coals are from the same region and vein and are alike in many respects. This is further illustrated by the average analyses, given in the following table, which have been made from all of the coal used in the hand-fired tests:

	Jamison coal 1917	Crows Nest coal 1918
Fixed carbon, percentage	56.21	56.80
Volatile combustible, percentage	31.34	29.68
Ash, percentage	11.67	12.26
Moisture, percentage	0.97	1.25
Total	100.19	99.99
Sulphur, percentage	2.15	1.41
B. t. u. per lb. dry	13,429	13,420
B. t. u. per lb. combustible	15,221	15,324

Tests with Hand Firing

Boiler Performance

Pressures and Temperatures.—An average boiler pressure within about four pounds of the rated pressure of 250 lb.

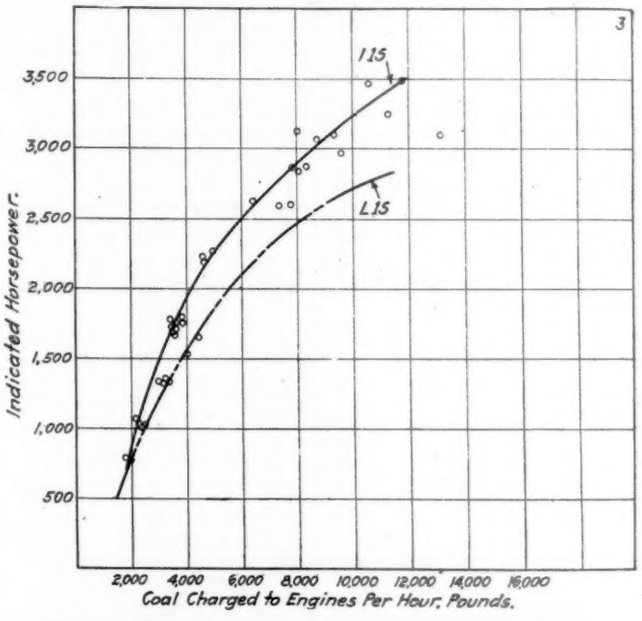

Fig. 3. Coal to Engine and Indicated Horsepower

per square inch, was maintained in all of these tests. The maximum pressure drop, or loss between the boiler and branch pipe was 18 lb., this drop being at a rate of steam

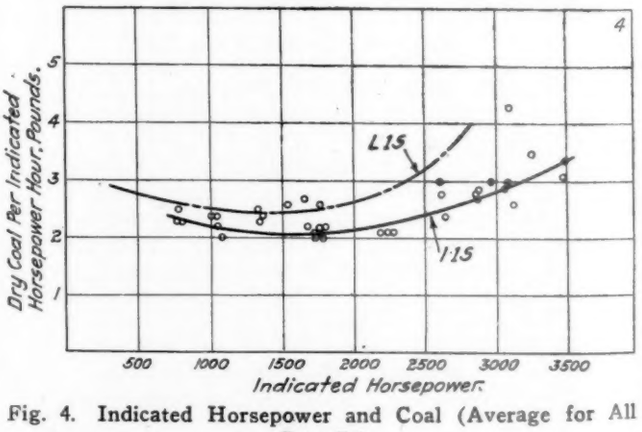

Fig. 4. Indicated Horsepower and Coal (Average for All Cut-offs)

flow of 58,000 lb. per hour. The exhaust steam pressure shows a maximum of 16.3 lb. per square inch. Even with a boiler pressure of 250 lb., the maximum superheat temperature was 282.8 deg., which is nearly as high as has been obtained on any locomotive on the test plant, all of which have had a boiler pressure at or below 205 lb.

Combustion, Draft and Temperature.—In general, the draft or vacuum was higher in the Ils than in the Lls at all rates of evaporation. This is to be expected, as the exhaust nozzle area was 35.8 sq. in. for the Ils and 38.3 sq. in. for the Lls. Though not greatly different, the smokebox temperatures are somewhat higher than in tests of the Lls.

The feedwater temperature was between 37.3 and 64.9 deg. The firing was all by hand as the locomotive was not at this time equipped with a stoker. The rate of firing reached 189 lb. an hour per square foot of grate, and at this rate the evaporation per square foot of heating surface was

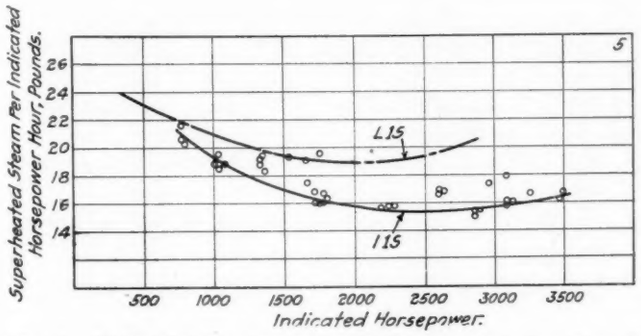

Fig. 5. Indicated Horsepower and Steam (Average for all Cut-offs)

10.3. The maximum rate of firing, in pounds per hour, was 13,226.

Evaporation.—The evaporation of this boiler appears to be less than was obtained from the smaller Lls boiler, but when the higher pressure and superheat of the Ils are considered, the maximum equivalent evaporation of the Ils is considerably above that of the Lls. The equivalent evaporation per pound of coal is illustrated by Fig. 15. The evaporation per pound of coal and the boiler efficiency results are about the same as were obtained in 1917 (see Fig. 1.). The equivalent evaporation per square foot of heating surface for the Ils reached a maximum of 14.7 lb. per hour.

Superheat.—The Ils shows a maximum superheat of about

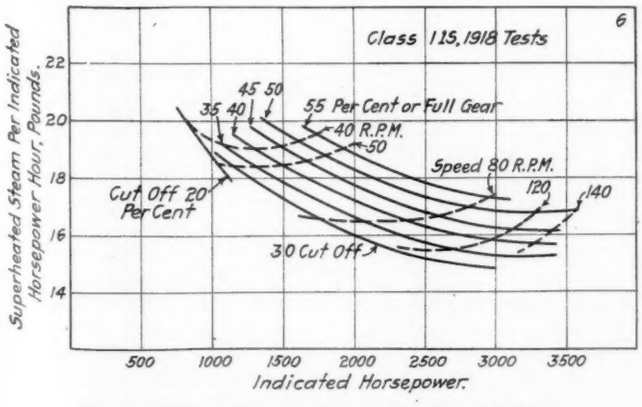

Fig. 6. Water Rates at All Cut-offs, Class Ils

280 deg. and at a rate of firing of 11,000 lb. per hour the superheat is about 15 per cent higher than for the Lls when equipped with a superheater of the same length as in the Ils, or 18 ft. When these two superheater surfaces are compared, that of the Ils is larger by about 20 per cent, on account of the larger number of elements.

The normal saturated steam temperature for the Ils is 406 deg. and for the Lls, with a boiler pressure of 205 lb., it is 389.5 deg. It would appear to be more difficult then to superheat the steam from the Ils boiler on account of its higher initial temperature, but notwithstanding this, a higher maximum superheat was obtained, although it is somewhat lower over part of the range.

The water heating surface of the Ils boiler is 8.8 per cent, the total heating surface 12.0 per cent, and the fire area through the tubes 7 per cent greater than the corresponding parts of the class Lls. For these reasons it was expected that an evaporation somewhat higher than in the case of the Lls class, over 59,000 actual, or 77,000 equivalent pounds per hour, would be possible when using an exhaust nozzle seven inches in diameter, or the same diameter as was used on the Lls.

With a seven-inch diameter exhaust nozzle (1917 tests), an evaporation of about 53,600 actual, or 72,500 equivalent pounds per hour was obtained. This was not considered sufficient, in view of the performance of the class Lls, and many changes were made in the arrangement of the diaphragm in the smokebox and different forms of stack were tried. Finally, by reducing the nozzle diameter to 6¼ in., an evaporation of 59,300 actual, or 81,900 equivalent pounds was obtained.

The tests of the 1918 series, beginning with 5401 and ending with 5416, were made with a seven-inch exhaust

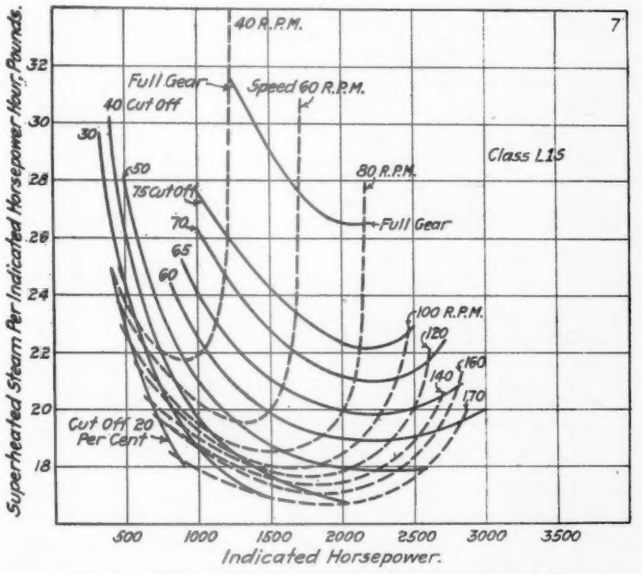

Fig. 7. Water Rates at All Cut-offs, Class Lls

nozzle, and it was used again in tests 5431 to 5438. Test 5412 at 80-55-F, evaporating 51,280 lb. per hour, proved to be the limit with this nozzle and smokebox arrangement. It was found, after test 5416, that cinders were accumulating in the front end, and to overcome this the exhaust nozzle was reduced to 6¾ in. and a deflector plate, eight inches wide, put on the edge of the table plate in front of the nozzle. This deflector made the gas passage, at the smallest area, the same proportion of the fire area of tubes as on the classes Lls and K4s, where it is 68 per cent.

Arranged in this way, the evaporation, in test 5443 was 58,300 lb., or an increase of about 14 per cent over the evaporation that could be obtained with the seven-inch nozzle without the deflector. When equipped with a stoker in later tests, an evaporation of 60,906 lb. was obtained, showing that the expected evaporation is easily possible with this locomotive.

While in the earlier tests a 6¼-in. exhaust nozzle was used, in the final tests it was found possible to use a 6¾-in. nozzle, but not a 7-in. The boiler conditions had been improved by the changes in the stack and front end, so that the 6¾-in. nozzle gave draft conditions as good and a

capacity as high as could be obtained with the 6¼-in. nozzle and the earlier arrangement of the front end.

Engine Performance

The engines of this locomotive, compared with long cut-off locomotives as to economy in coal and steam, have yielded expected results. The tests have shown that the restricting of the cut-off has had the desired effect in that, in full gear, where the bulk of the work is done, this locomotive operates much more economically than the Lls. This advantage, as expected, is reduced as the engines are cut back, but it is not until we have gone below the most economical cut-off for both locomotives that the Lls and Ils show the same economy at a given horsepower. This, moreover, is the case only at the lower horsepower (in short cut-offs at low speeds), that is, for but a small portion of the work done by the locomotive when in normal railroad service.

Indicator Diagrams and Action of Starting Ports.—Representative indicator diagrams are shown in Fig. 2. The principal point of interest in these diagrams is the action of the auxiliary starting port. It opens before the opening of the main port, having a lead of 1 15/16 in. in the tests

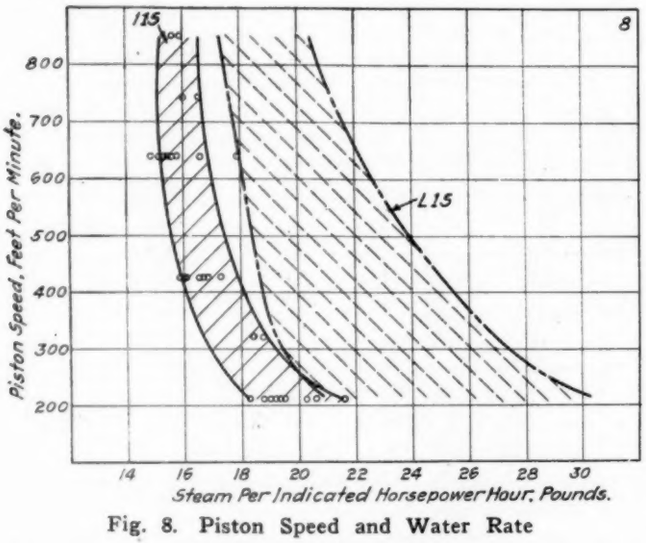

Fig. 8. Piston Speed and Water Rate

here recorded, as against 3/16 in. for the main port and, on the indicator diagrams, the effect caused thereby can scarcely be noticed. Considering the cards for full gear, there is no evidence that the auxiliary ports admit a sufficient amount of steam to hold up the admission line appreciably, after the cut-off of the main port. The testing plant conditions in starting are not the same as on the road, on account of there being little or no resistance to turning the locomotive wheels and no rolling load, in the form of the locomotive itself and the train.

Indicated Horsepower.—The test results in indicated horsepower are plotted on Fig. 3. The range of horsepower was between 766.6 and 3,486.1. The highest power was obtained at a speed of 140 r.p.m, which is equivalent to 25.3 m.p.h.

The superheated steam used per i.h.p. hour was between 14.9 and 21.6 lb. In 12 of the tests the steam used per i.h.p. hour was 16 lb. or less. On 16.6 lb. of steam per i.h.p. hour, an indicated horsepower of about 3,500 was developed.

Many tests show a coal consumption of between two and two and a half pounds per horsepower hour, while the maximum rate, neglecting test No. 5417 as abnormal, was less than three and a half pounds per i.h.p. hour. The curves as drawn for the class Ils, Figs. 4 and 5, show lower results in steam and coal per unit of power than for the class Lls at any power.

The indicated horsepower at 7.4 miles per hour, in full gear, is 1,743.7. With the Lls at the same speed in full gear it is about 1,220. This is an increase in power over the Lls of about 43 per cent. The maximum horsepower was obtained at 25 miles per hour and 45 per cent cut-off; this was 3,486. With the Lls the maximum power at this speed was 2,755, or about 80 per cent of that of the Ils. The Lls has developed on the test plant 2,954 hp. at a speed of 29 m.p.h.

Steam Rate Curves.—In Figs. 6 and 7 curves are plotted

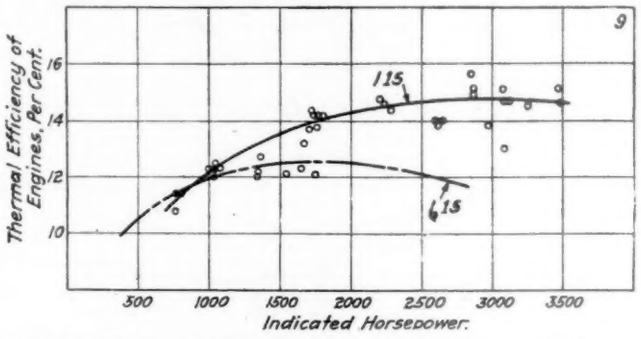

Fig. 9. Indicated Horsepower and Efficiency of Engines

showing the whole range of weight of steam per indicated horsepower hour for the locomotives, classes Ils and Lls. Considering the speed of 40 revolutions per minute or 7 m.p.h., and full gear, it is found from these diagrams that the Ils developed 1,740 i.h.p. and used about 19.5 lb. of steam per horsepower hour, while the Lls developed 1,230 hp. and used 31.5 lb. of steam per horsepower hour. At a speed of 120 r.p.m., 22.1 m.p.h., and at a cut-off of 50 per cent, for the Ils the horsepower is about 3,280, while for

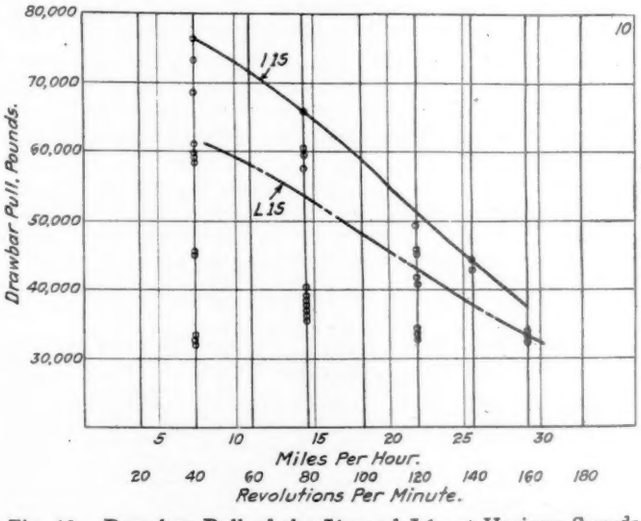

Fig. 10. Drawbar Pull of the Ils and Lls at Various Speeds

the Lls it is about 2,050, and the steam per indicated horsepower for the Ils is 16.8, while for the Lls it is 18.0. In this latter case little or no saving would be expected and the difference may be attributed to difference in quality (pressure and superheat) of the steam. In full gear, at low speed, the reduction in the steam per indicated horsepower by the Ils over the Lls is, as above indicated, approximately 38 per cent.

Piston Speed and Water Rates.—The water rate of the locomotive improves to a certain extent with an increase in piston speed, and this is shown by the plotted results in Fig. 8. The weight of steam per indicated horsepower for the Ils locomotive is in a separate zone from that of the

Lls, and less steam is used when the two locomotives are tested under like conditions.

On account of the small exhaust nozzle and higher boiler pressure, the back pressure was in general somewhat greater than for the Lls.

Thermal Efficiency of Engines.—The thermal efficiency of the engines alone, referred to indicated horsepower, calculated according to the method of the A.S.M.E., is shown in Fig. 9. This efficiency is the proportion of the total heat consumed which is converted into work in the cylinders. The heat considered is that in the steam in the branch pipe,

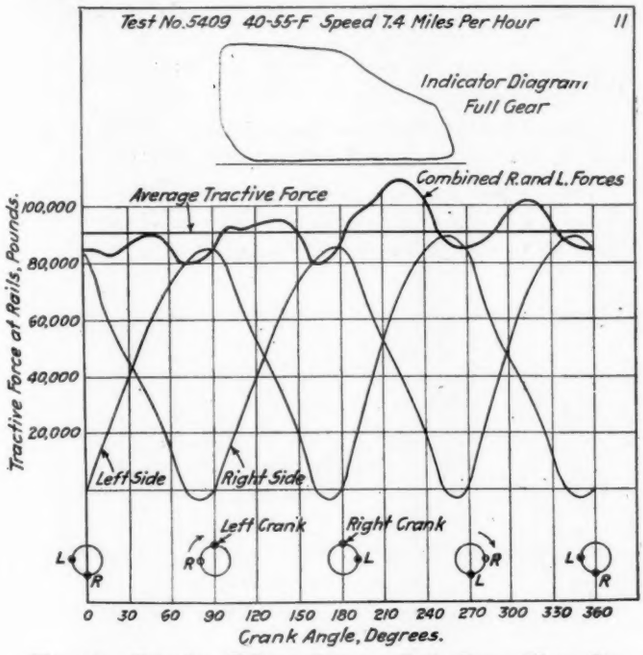

Fig. 10. Tractive Effort Curves, Full Gear, Class I1s

above an ideal feedwater temperature which is assumed to be that as observed of the steam in the exhaust pipe. These efficiency results show that there is much improvement in the Ils over the class Lls. The efficiencies of the locomotive are between 10 and 16 per cent, while those of the class Lls are between 10 and 14 per cent.

Locomotive Performance

The dynamometer horsepower shows increases and economies closely following those for indicated horsepower. Many tests have a coal rate of 2½ lb. (see Fig. 16) and a steam rate of less than 18 lb. The minimum rate was 16.8 lb. of steam per d.h.p. hour. Both the coal and water rates are below those of the class Lls for all dynamometer horsepowers.

The drawbar pulls obtained upon the testing plant are shown in Fig. 10. To be 25 per cent greater than the pull of the Lls at 40 r.p.m., the Ils should have a pull of about 75,000 lb., and this pull was considerably exceeded. In the tests with 30-in. cylinders at a speed of 40 r.p.m. or 7½ m.p.h., the drawbar pull on the test plant was 68,000 lb., and later on the road about 76,000 lb. With the new 30½-in. cylinders, on the test plant the pull at this speed was 76,000 lb.

Cylinder Tractive Force.—Comparative turning moment or cylinder tractive force curves for the class Ils Decapod type, and the class Lls Mikado type, are shown in Figs. 11 and 12. It will be seen from these diagrams that the turning moment in the case of the class Ils, cutting off at half stroke, forms nearly as smooth a curve as for the class Lls, cutting off at nearly full stroke, and therefore that the advantages of a favorable cut-off are obtained in this locomotive without introducing high peaks in the curve or any unusual tendency toward slipping of the driving wheels.

Machine Friction.—The machine efficiency of this locomotive is plotted in Fig. 13. The highest efficiency is 91.7 per cent. At the lowest speed of the tests, 7.4 m.p.h. in full gear, it was 85.6 per cent. In tests of the class Lls the machine efficiency was in some cases as high as 95 per cent and at 7 m.p.h., in full gear, it was 94 per cent. The thermal efficiency of the locomotive (proportion of total heat consumed converted into work at the drawbar) is shown in Fig. 14. The Ils developed a maximum efficiency of 8.1 per cent, while the highest atained by the Lls was 7.0 per cent.

Tests with Duplex Stoker

Following the hand-fired tests locomotive No. 790 was equipped with a Duplex stoker. It was then returned to the test plant and the tests continued with the stoker in use. The stoker was piped so that its exhaust steam could be turned into the base of the elevator screws to dampen the coal, the claim being made that this will reduce the smoke.

For the remaining tests the stoker was used without any hand firing and the test conditions duplicated as nearly as possible the hand-fired tests. Some of the stoker-fired tests were made to obtain the steam consumption of the locomotive only and were run for too short a time for reliable coal data. These have not been plotted on the diagrams.

The stoker speed at first was found to be too low, not over 40 strokes per minute, and in order to increase the

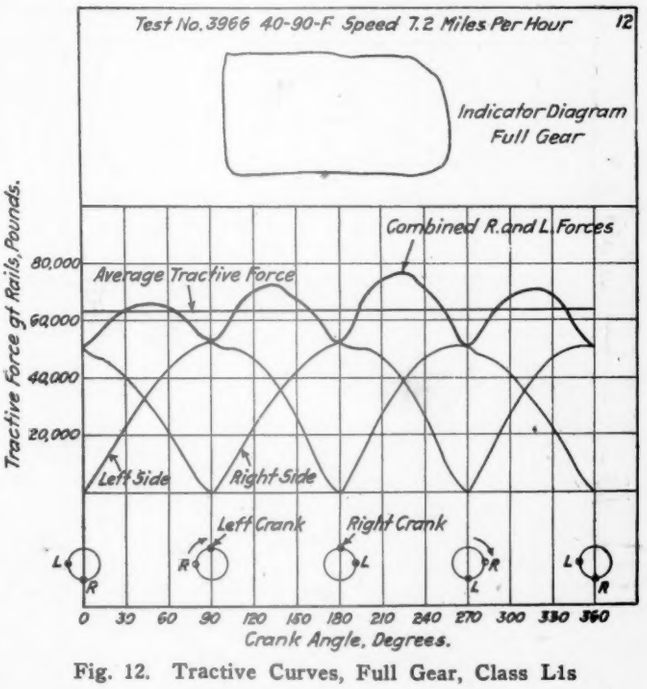

Fig. 12. Tractive Curves, Full Gear, Class L1s

speed changes were made in the steam ports of the stoker cylinder by enlarging and extending them. The exhaust pipe from the stoker engine was also enlarged to two inches. After these changes the stoker could be run at 48 strokes per minute, and it was possible to fire all of the coal that could be burned. The same kind of coal was used for the stoker tests as for the hand-fired tests, namely, Crows Nest run-of-mine.

The exhaust steam from the stoker cylinder was led to a condenser and the condensed steam weighed in the first nine tests. From these records it was found that about ¼ lb. of steam was used per double stroke or revolution of the stoker, and for the remaining tests the stoker exhausted to the atmosphere and the steam used was calculated. The

steam used by the stoker steam jets could not be measured directly and was calculated by the Grashof formula.

Coal.—The average analyses of the Crows Nest coal used for the hand-fired and stoker tests, are shown in the following table and indicate a very small difference.

	Hand fired	Stoker fired
Fixed carbon, percentage	56.80	58.68
Volatile combustible, percentage	29.68	29.92
Ash, percentage	12.26	10.18
Moisture, percentage	1.25	1.23
Total	99.99	100.01
Sulphur, percentage	1.41	1.54
B.t.u. per lb. dry	13,420	14.130
B.t.u. per lb. combustible	15,324	15,662

Results of Tests.—The results of the stoker-fired tests are plotted in Figs. 15 and 16, and on these diagrams the hand-fired test results, made immediately before the application of the stoker, are shown for comparison.

Maximum Capacity with Stoker.—It is evident from the tests that the evaporation and rates of firing are but little more than can be obtained by hand firing, so that the capacity of the locomotive was not increased by the stoker, but of course the maximum evaporation is obtained with much less exertion on the part of the fireman, and also it is evident that the maximum evaporation can be sustained for a longer time with the stoker.

It was found that the boiler could not be forced much beyond an evaporation of 60,000 lb. per hour, indicating this to be the boiler limit for both hand and stoker firing.

Coal Economy with Stoker.—A further analysis of the stoker test results shows that hand firing is superior

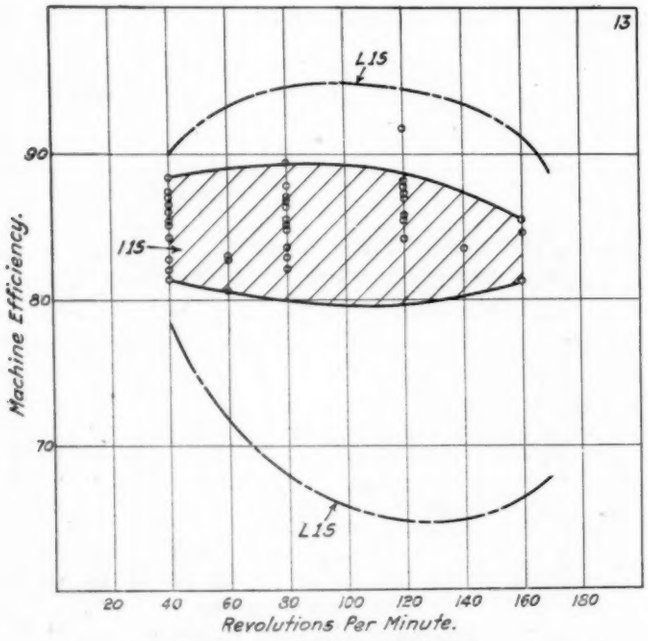

Fig. 13. Machine Efficiency

in evaporation per pound of coal at low rates of firing, but that this advantage decreases until, when the boiler is evaporating its maximum weight of water the stoker firing is no less economical than the expert hand firing. The advantage shown for hand firing is about 19 per cent when firing 40 lb. of coal per square foot of grate per hour, and decreases to nothing when firing 180 lb. per square foot. (See Fig. 15.) There is practically no difference in the superheat of the steam with or without the stoker. The range of the superheat is between 130 and 285 deg.

Stoker Exhaust to Conveyor.—The stoker engine ordinarily exhausts to the atmosphere, but there is also a pipe connection to the base of the elevator screws, and when this was used the coal was dampened by the exhaust steam. With this connection in use in test No. 5470 there was a marked reduction in the smoke and also a smaller coal consumption, but as there was only one test made under these conditions no very definite conclusions can be drawn, although the indications are that there is some advantage to be gained by its use. The results obtained with it, compared with both hand and stoker-fired tests without it, are shown in the following table:

Test No.	Test designation	Coal fired, lb. per hour	Equivalent evaporation per lb. dry coal	Smoke percentage	Exhaust of stoker engine to—
Stoker-Fired Tests					
5,470	120-30-F	5,505	9.1	15 6	Conveyor
5,447	120-30-F	5,783	8.7	27.0	Atmosphere
5,449	120-30-F	6,019	8.3	22.8	Atmosphere
5,456	120-30-F	6.304	7.8	32.4	Atmosphere
Hand Fired Tests					
5,432	120-30-F	4,641	10.3	7.2	.....
5,428	120-30-F	4,720	9.8	8.2	.....
5,441	120-30-F	4,943	9.7	18.8	.....

Steam Used by Stoker.—The estimated weight of steam used by the stoker ranged between 393 and 1,629 lb. per

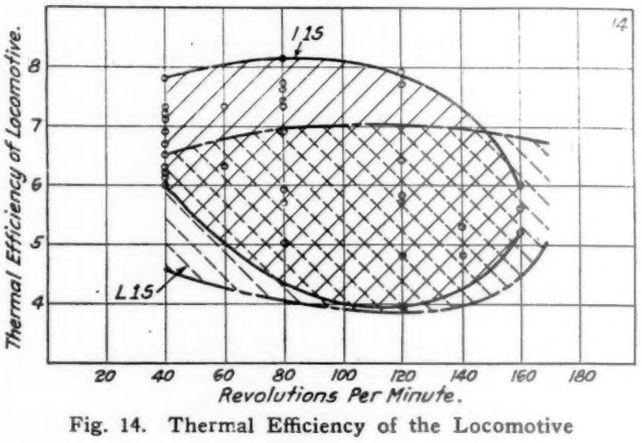

Fig. 14. Thermal Efficiency of the Locomotive

hour, and was about two per cent of the steam generated by the boiler. There was more hooking or leveling of the fire in hand firing than when the stoker was used. This would indicate that the stoker maintained a more nearly level fire than could be obtained by hand firing. The number of times the grates were shaken was practically the same for either hand or stoker firing.

Conclusions

With this boiler, carrying a steam pressure of 250 lb. per sq. in., no difficulty was found in superheating the steam to a high temperature. The water and superheating surfaces are larger than those of the class Lls locomotive and a greater equivalent evaporation was obtained.

The engines of this locomotive compared with long cut-off locomotives as to economy in coal and steam, have met expectations. The tests have shown that the restricting of the cut-off has had the desired effect in that, in full gear, where the bulk of the work is done, this locomotive operates much more economically than the Lls. This advantage, as expected, is reduced as the engines are cut back, but it is not until below the most economical cut-off for both locomotives that the two classes of locomotives show the same economy.

In the results of the tests which show power and steam used, the action of the stoker need not be considered, and it was found in many tests that the steam rate per i.h.p. hour was 16 lb. or less. At a rate of only 16.8 lb. of steam per hour an indicated horsepower of over 3,500 was developed. The saving in steam per indicated horsepower over the Lls is very evident and, except at low horsepower at low speed, it is not possible to operate the Lls at as good advantage as the Ils, and in full gear at low speed, the reduction in steam per indicated horsepower, over the Lls is 38 per cent.

The maximum evaporation was obtained with the stoker with very little exertion on the part of the fireman. The stoker fired a fairly level fire, and could be operated under

all conditions in a satisfactory manner without any hand firing.

Except at the highest rates of firing, the stoker is wasteful in the use of coal, but appears to be no more wasteful than other stokers, and in addition has advantages over the other

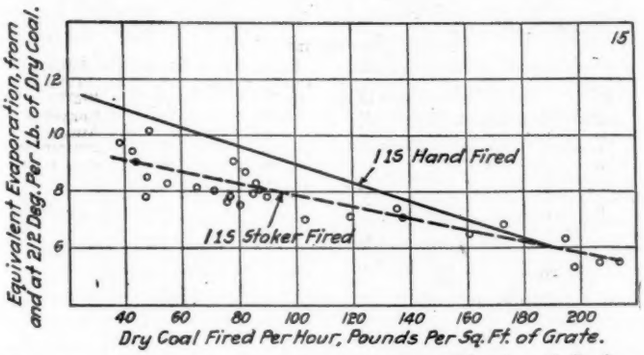
15
Equivalent Evaporation, from and at 212 Deg. Per Lb. of Dry Coal.
12
10
8
6
115 Hand Fired
115 Stoker Fired
40 60 80 100 120 140 160 180 200
Dry Coal Fired Per Hour, Pounds Per Sq. Ft. of Grate.

Fig. 15. Evaporation per Pound of Coal, Hand and Stoker Firing

stokers tested, in ease of operation and in the absence of obstructions at the fire door and on the grates.

The estimated weight of steam used by the stoker was about two per cent of the steam generated by the boiler. The advantage shown for hand firing over the stoker firing in

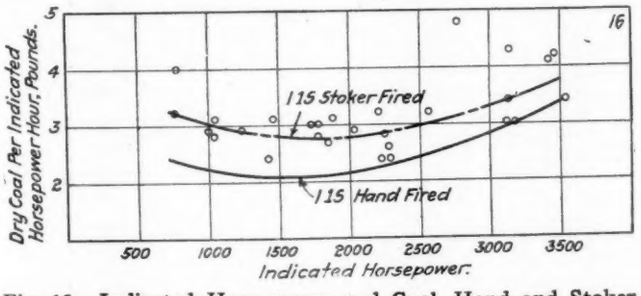

Fig. 16. Indicated Horsepower and Coal, Hand and Stoker Firing

equivalent evaporation per pound of coal is about 19 per cent when firing 40 lb. of coal per square foot of grate per hour, and decreases to nothing when firing 180 lb. per sq. ft.

With the stoker it is to be supposed that a greater number of firemen could obtain the full capacity of the locomotive than would be the case with hand firing, because of the ease of handling the stoker. Such considerations, combined with those of economy or capacity as shown by tests, in the case of locomotives of this class, must govern in deciding whether a stoker is necessary.

Campaign to Stabilize Coal Industry

A NATION-WIDE DRIVE to stabilize the coal industry by promoting the early purchase and storage of coal, in order to distribute production and the consequent demand upon railroad facilities more evenly throughout the year, was initiated by the Bituminous Coal Commission, appointed by the President to settle the question of miners' wages, before it closed up its affairs last week. The Council of National Defense has been asked by authority of the President, to assume the specific duties outlined for it in the recommendations of the commission, which were published in last week's issue, and which contemplate that it shall try to bring about a concentrated effort by all concerned to put them into effect.

The following definite steps have been taken:

1. The President has written a personal letter of instruction to the heads of all departments and federal agencies, to the end that they may give personal attention to the purchase and storage of a three months' winter supply of coal. The President believed that a personal letter to this end would do the work even better than a mere formal executive order.

2. The Council of National Defense has assumed the duty of obtaining the support of the general public in the stabilization of the coal industry through the purchase, transportation and storage at the point of ultimate consumption of its winter supply of coal—this to be done during the spring and summer months.

3. The President has transmitted to the Interstate Commerce Commission a copy of the bituminous award and recommendations, to the end that the Interstate Commerce Commission take such action as it may deem advisable in the premises. (This is in connection with the car problem.)

4. Letters have been sent to the governors of the various states, (2) the supervisors of all counties, and (3) the mayors of all cities asking that executive orders be issued for the purchase and storage of coal for public buildings and on all public works.

5. The steel corporations have been asked to purchase and store coal during the spring and summer. They have agreed.

6. The support of the public utility corporations of the country for the purchase and storage of coal has been pledged by their representatives in Washington.

7. A letter has gone to the governor of the Federal Reserve Board asking that board to issue memoranda to the various Federal Reserve Banks, requesting that they look with favor upon paper for rediscount drawn against coal in storage.

8. The Washington representatives of the various state railway and public utility commissions will transmit to the various state bodies having control over rates the report and award of the coal commission, asking that the state bodies use their influence with public utility companies for the purchase and storage of coal, reflecting the cost in rates if necessary.

9. The United States Chamber of Commerce will issue copies of the commission's report, award and recommendations to all chambers of commerce in the United States, so that the business men of the country may be informed as to conditions and may be induced to purchase and store coal.

10. Through the Association of Railway Executives, copies of the commission's award will be transmitted to all railroad and steamship companies in the United States, with the request for their co-operation.

The commission believed that it was not at all adequate to ask people to buy and store coal, but that constituted authority should issue orders wherever possible for such purchase and storage, and that where orders could not be issued it should be made financially attractive for the general public and the various corporations to purchase and store this coal—this because the commission realized that with a car shortage in the winter and with a lack of market in the summer no other method could be devised for the stabilization of this industry.

If the school houses of the United States, the various court houses, jails and other public buildings can be ordered to lay in the necessary supply, a part of the domestic peak of winter requirement will be eliminated.

The public utility corporations and a great many manufacturers have been so dangerously near coal famine in the past, and want of cars next winter may so seriously affect the ability of the carriers to handle coal, that it was the commission's belief that the purchase of coal during the summer months could be made a permanent thing. In this regard, the public utility corporations already have agreed to store more than 12,000,000 tons, although no complete canvass of the companies has as yet even been attempted. Therefore, the storage of coal by utilities will greatly exceed this amount.

The general public was warned, however, to place its orders

in May, June and July, on the ground that unnecessary buying in April would be liable to result in a flurry in coal prices.

Director General Hines on March 24 issued an order suspending all regulations pertaining to coal issued under his authority, as of April 1, and the central, regional and district coal committees were instructed to devote the remaining period before that date to carrying out to conclusion settlements for coal diverted prior to April 1.

The Relation of Punitive Overtime to Freight Train Operation

By G. D. Brooke

Superintendent of Transportation, Baltimore & Ohio, Western Lines; Cincinnati, Ohio

WITH THE ADVENT OF THE time and-one-half overtime rate in road freight service, the problem presents itself to the operating man to determine to what extent the speed of freight trains can be increased to meet the higher cost of wages. The conditions surrounding quick-despatch or preference trains, local or way freight trains and pick-up, mine-run or roustabout trains are usually such that their speed while moving is determined by other factors than those which govern the speed of slow freight train. The speed of quick-despatch or preference trains is governed by the traffic or service conditions; way freight, pick-up and other trains having a great deal of switching and other work at stations have to move rapidly between stations in order to maintain schedules and to prevent the total time on the road becoming excessive. In reducing the hours of service of the crews of such trains it is necessary to deal with other features of operation than the speed between stations.

With slow or tonnage freight trains the time moving on road forms a large percentage of the total time and the speed of the trains has an important bearing on the tonnage hauled and consequently on the cost per ton mile of the transportation. The speed of such trains in ascending the ruling grades of the engine district is a governing factor in fixing the tonnage rating of the engine. Conversely, the tonnage rating assigned to the engine governs the speed of the train on the ruling grade. And the speed on the ruling grade determines to a greater or less extent, depending on the number or lengths of the grades of the ruling gradient, the average speed of the train over the district and the number of hours required to make the run.

The table gives the cost per train hour of a slow freight train drawn by a Mikado locomotive for various train-days of from 8 to 16 hours, inclusive, and the diagram shows for various grades from level to 2½ per cent the decrease in tonnage rating of a Mikado locomotive with increases in speed from 5 to 30 miles per hour. It will be noted that the increase in cost per train-hour due to overtime, when the total of all items of expense which may reasonably be considered as affected by lengthening the train-day is taken into account, is relatively small, while the decrease in tonnage rating with increases in speed is very great. The exercise of much care is therefore advisable in increasing the speed on ruling grades and the effect on the cost per ton-mile should be the criterion rather than the reduction in overtime.

Since conditions on engine districts vary widely, each will present a separate study, but the principles involved will be the same. By small reductions of the train load on the ruling grade trains will be enabled to start more quickly, sidings can be entered and left more promptly, the engine and train crew will have more confidence in their ability to move with precision and will be able to better take advantage of any situation to advance the movement when opposing or following trains are involved; the train despatcher will work with more confidence and the general result will be a more snappy movement and reduced train hours. On the other hand, high speeds on running grades will require such reductions in trainload that the number of trains will be greatly increased with resulting interference; aggregate train hours required to handle the tonnage will remain high and ton mile cost will be increased.

While each division superintendent has his particular problem, small reductions in tonnage rating are advocated where any are necessary, while proposals for large reductions in trainload should be scrutinized with care and acceded to only after exhaustive study and positive conclusions that they are sound.

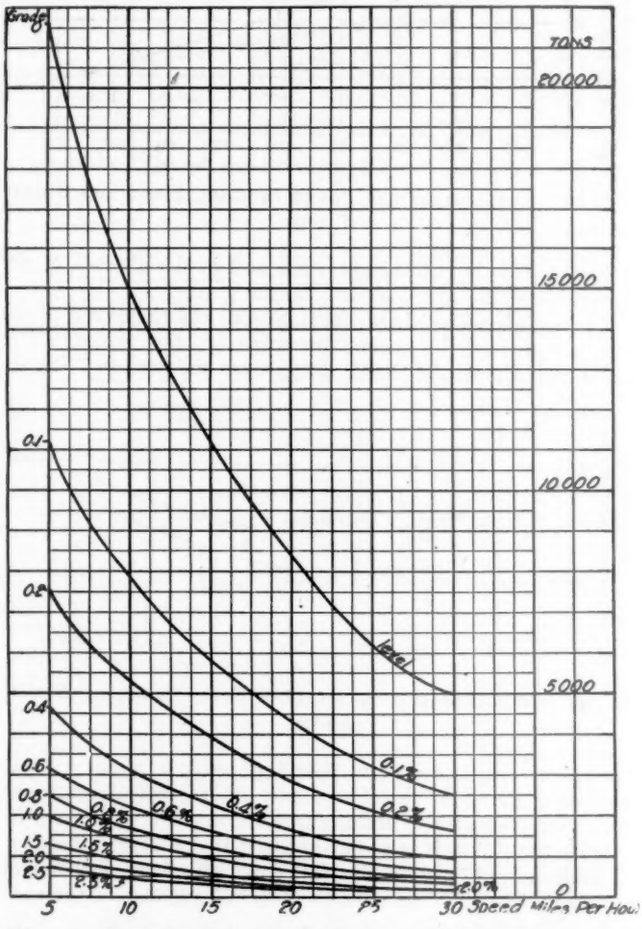

Diagram Showing Decrease in Tonnage Rating with Increase in Speed for a Mikado Locomotive with a Tractive Power of 50,300 Lb.

TABLE SHOWING RELATION OF TIME-AND-ONE-HALF OVERTIME TO TRAIN-HOUR COSTS

Hours per trip	Slow freight service cost per hour			Per cent wages to total
	Wages	Other	Total	
8	$3.17	$8.85	$12.02	26.4
9	3.34	8.85	12.19	27.4
10	3.48	8.85	12.33	28.2
11	3.60	8.85	12.45	28.9
12	3.69	8.85	12.54	29.4
13	3.77	8.85	12.62	29.9
14	3.85	8.85	12.70	30.3
15	3.91	8.85	12.76	30.6
16	3.96	8.85	12.81	30.9

Note—The figures are for trains handled by Mikado freight locomotives. Other cost includes fuel, water, engine and train supplies, locomotive repairs, depreciation, etc., but does not include maintenance of way and general expenses.

*From the report of the Committee on Economics of Railway Operation of the American Railway Engineering Association.

Railroad Valuation and the Unearned Increment*

"To Limit Railway Income Is to Legislate Into an Affirmative Policy What Was First Developed as a Rule of Negation"

By Homer B. Vanderblue
Assistant Professor of Transportation, Northwestern University

THE PROPOSAL to regulate railroad earnings, of which so much has recently been spoken in both houses of Congress, is a disguised, even if an unconscious, attempt to discriminate against the holders of railroad securities. Certainly the American people have not passed upon the proposal to regulate profits; perhaps, indeed, because the rising level of railroad operating costs has served since 1907 to consume the differential which with an expanding tonnage might otherwise have been pointed out as monopoly profit or unearned increment—both terms seldom defined. The railroads have repeatedly come to the Interstate Commerce Commission asking higher rates, which have been but sparingly given. In 1910 and in 1914 the railroads received small advances and considerable obvious advice to economize. Under the war powers of the President an executive order raised the level of rates beyond what the private interest had ever asked. But when a return to private ownership is contemplated, discussion of limiting earnings is coupled with the discussion of the surrender of the properties.

Why? The answer is to be found not alone in loose talk about monopoly, but in the twisting of a doctrine based upon general remarks appearing in a Supreme Court opinion of 1898; the famous case of Smyth vs. Ames. To limit railroad income is to legislate into an affirmative policy what was first developed as a rule of negation.

The Supreme Court has held that the fourteenth amendment (which was passed to meet quite another set of problems) insures to the railroad the right to receive just compensation for the service given the public. And in the course of adjudication Justice Harlan voiced his now-famous rule:

> But this rule set only a minimum below which a legislative body might not go. In its effect (whatever the wording) it was purely a restraining influence. Rates might not be established "so unreasonably low as to prevent the railroad companies from earning such compensation as would be just." The confiscation doctrine set only a minimum. How much more the rate of return might be rested within the range of "legislative discretion."
>
> "The basis of all calculations as to the reasonableness of rates must be the fair value of the property being used for the public."

But Congress in 1913, acting upon urging by the Interstate Commerce Commission, which at no time appears to have made a rigorous analysis of the underlying economic problem, passed an act directing the commission to "value" the railroads. In this task that body, through a subordinate bureau, has, therefore, been since engaged. This work promises now to be completed, in large part at least, before the end of 1920. For the Texas Midland, Winston-Salem Southbound, and Kansas City Southern roads formal findings and orders as to "basic facts" have been published. Strictly speaking, these findings do not contain totals of value at all, but instead a heterogeneous group of unrelated figures. There is a summary of "cost of reproduction new" and of "cost of reproduction less depreciation" of the railroad plant, as distinguished from land; figures of the "present value" of land and of "original cost" where found. Somehow these are later to be used to fix a single sum as value, but nowhere is a method of procedure made evident. The valuation act offers no help by way of definition or formula. Value would seem to be one thing and cost quite another. A "cost value" is indeed *sui generis*. The truth is that the Congress and the commission are blindly following *dicta* of Justice Harlan when analysis of the underlying problem in terms of economic principles is demanded. For the valuation act is after all only an attempt to measure in dollars the elements of "fair value" listed in the "rule" of Smyth vs. Ames:

> "In order to ascertain that value the original cost of construction, the amount expended in permanent improvements, the amount and market value of its bonds and stocks, the present as compared with the original cost of construction, the probable earning capacity under particular rates prescribed by statute, and the sum required to meet operating expenses, are all matters for consideration, and are to be given such weight as may be just and right in each case. We do not say that there may not be other matters to be regarded in estimating the value of the property."

Instead of stating a rule or expressing a judgment, the truth is rather that Justice Harlan sought to avoid committing the Supreme Court to a single standard of value. He included in his summary every element which entered into the record at any point. But in the Minnesota Rate Cases (1913) Justice Hughes subscribed to an inquiry based broadly upon these vague provisions. "Value is not controlled by artificial rules" and its ascertainment is "not a matter of formula." On the contrary, "there must be a reasonable judgment of all relevant facts." Surely so long as "reasonable" qualifies both the process of determination and the "value" sought for, a rule has not been voiced in unequivocal language.

Valuation and Reasonableness of Rates

The truth is that the value of a railroad cannot be used as a test of the reasonableness of that carrier's rates. For the value of any machine (and the railroad is a highly specialized machine) depends upon the earnings which accrue from its use. To test rates by the value of the property before the act of regulation is made effective means the abandonment of regulation. And to test them by the value of the property, once new schedules are in effect, means the approval of any schedule that may be established. Something other than value (as the economist and business man usually speak) is meant.

To step out of this vicious circle resort has been had to appraisal, and most frequently to appraisal in terms of "cost of reproduction." But cost of reproduction obviously does not measure value in the sense of what a purchaser would pay for a property. Let the owners of the old Wabash Pittsburgh Terminal put their road upon the market to prove the truth of this assertion. To be sure, cost of reproduction has been one of the elements considered in purchases in the past; but it is important, not as a test value but rather as insurance, that the original property has been maintained. Or if a railroad faces the alternative of building a parallel line or of absorbing a potential competitor, the sellers know that the prospective purchaser's maximum price is set by the cost of building an alternative road. Reproduction cost may be "a fundamental though not necessarily a controlling element in

*The basic economic theories here discussed are expanded and authenticated in the writer's Railroad Valuation, Houghton Mifflin Co., 1917; and in an article appearing in the November, 1919, and February, 1920, Quarterly Journal of Economics, "Railroad Valuation by the Interstate Commerce Commission." References to page and volume of authorities is therefore here omitted.

value."[1] But (as taking account of competition) revenue, existing or prospective, will still be the ultimate determinant of value. The crucial test is the stock market quotation. Value is an exchange relationship.

The commission has reported no figures of the cost of reproducing or reacquiring carrier lands, although the act directs, as regards land, an investigation and report of "present values" and "original cost" and "separately the original and present cost of condemnation and damages or of purchase in excess of . . . original cost." The authority for this omission is language of Justice Hughes in the Minnesota Rate Cases:

"The conditions of ownership of the property and the amounts which would have to be paid in acquiring the right of way, supposing the railroad to be removed, are wholly beyond reach of any processes of rational determination. The cost of reproduction method * * * does not justify the acceptance of results which depend upon mere conjecture."

The commission has felt the "clear" duty to abstain from reporting as an "ascertained fact" figures which are incapable of rational ascertainment.

Instead the "present value" of land is reported. These so-called value figures are in turn premised upon a conscious attempt to apply other *dicta* of Justice Hughes:

"Assuming that the company is entitled to a reasonable share in the general prosperity of the communities which it serves, and thus to attribute to its property an increase in value, still the increase so allowed * * * cannot extend beyond the fair average of the normal market value of land in the vicinity having a similar character."

The court here really decided nothing affirmatively or explicitly. The conclusion is qualified by an assumption neither approved nor disapproved. But in terms of this assumption Justice Hughes set a maximum which is now reported as "present value" without analysis of the underlying problem.

"Present value * * * is arrived at by ascertaining the number of acres of land owned or used by the carrier for its purposes as a common carrier and multiplying this acreage by a market value of similar and adjoining lands."

The figures of "present value" so determined have been justly denominated as "*a* present value measured in *a* particular way" and not as "*the* present value."

Determining Value of Railroad Land

Can the value of railroad land be measured by the value of adjacent land? Take first the situation of agricultural land; eliminate the railroad, what would the land be worth, deprived of a mode of transportation to market? Or consider the value of land in villages and the smaller towns served by a single road. Not infrequently the railroad itself, when extending into relatively unsettled areas, has plotted town sites and sold single lots for sums which before the coming of the road would have bought acres. Sometimes an enterprising promoter has done the work of exploitation. But in either case depriving the town of the railroad would destroy the site rent. Nor is the situation essentially different where a number of roads have centered and a city—large or small—has grown up. The value of land, urban and rural, is itself largely dependent upon the presence of the railroad. "If there were no railroads in Chicago there would be no Chicago."

The commission formula must fail also when applied to land peculiarly adapted for railroad purposes. How apply the formula to the narrow river bank or the mountain pass? For any purpose except for that of transportation these sites may be quite valueless. Everywhere the railroad follows the line of least physical resistance. How value the right of way of the New York Central up the Hudson by the adjacent land test, or that of the Chesapeake & Ohio in the Kanawha and Ohio valleys? It is not accidental that the railroad follows the river, nor in the older sections that an abandoned canal is frequently seen from the car window. The Baltimore & Ohio fought a bitter legislative battle with the Chesapeake & Ohio Canal for the narrow gap near Harpers Ferry, and the Santa Fe and Rio Grande used armed forces during the struggle for the Royal Gorge of the Arkansas. The easy slope or the rift in the mountains means a saving in construction and a continuing saving in operation. Such a site for a railroad is in a position essentially similar to the wheat land which can be cultivated at the least cost per bushel of wheat. Until the coming of the railroad much of this land was unused and unusable. But the easier slope and the natural cuts make land valuable for railroad purposes which is for any other purpose substantially valueless. Because the railroad must conform to the construction standards imposed by operating requirements it will bid high for land which offers differential advantages.

But how is this value to be determined? The answer of the economist must be that (so long as *value* is sought) the value of the railroad site must be determined as the value of other land is determined—by the capitalization of the economic rent accruing on the site. The value of land used for business cannot be determined by comparison with the value of land for residence purposes. How much a man can afford to pay for a given trading site depends upon how much above the return on the cost of the building the returns from the business can net. Now, the railroad structure occupies a position analogous to that occupied by the modern office building, with the exception — save perhaps in a crowded city—that the railroad site, if tracks are removed, cannot be devoted to another purpose. The abandoned line of the Buffalo & Susquehanna or the unfinished grade of the Providence extension of the Grand Trunk are lost for economic purposes. The sites (however much they may have cost) are worthless, and that portion of the investment analogous to cost of the office building proper, the cost of the grade, the ties, the culverts and bridges, is lost once for all. By removing the rails and selling them, as by tearing down the building and selling the materials, something can be recovered; but only a portion. For the railroad is a highly specialized case of "capital sunk in soil," and once investment is made in grading and providing the necessary permanent structures the roadbed and site are substantially merged. Whether the investment shall prove warranted depends in the long run not on the cost on producing the structure but upon demand—the volume of traffic, the level of rates maintained and operating costs. The return is a "quasi-rent."

Factors Determining Railroad Value

With a constant price level net earnings tend to increase with the passage of time, partly from general social causes, partly from effort expended by the railroad organization. Population filters in; industries and groups of industries concentrate. The volume of traffic increases, and, due to the large element of fixed costs in railroad operating expenses, increasing returns develop. Much necessarily depends upon the natural resources of the tributary country—deposits of coal and iron ore, oil, supplies of lumber, but not everything. Efficient management in seeking out business for locations and locations for businesses and in establishing favorable rate structures (such as those which built up the Pacific coast lumber industry) has been a not inconsiderable factor in increasing the "traffic density" of the railroads. Or the railroad manager, seeing that the building of a short connection will increase the use of his plant for through business, constructs the necessary railroad. The joint building of the Winston-Salem Southbound by the Atlantic Coast Line and the Norfolk & Western is here a case in point. Or a railroad built to exploit a particular natural resource, as the Carolina, Clinchfield & Ohio was built to open up coal fields owned by the syndicate which built the road, seeks to become a link in a new through route competing for the traffic between the Ohio river and the southeast. Additional business secured is analogous here to additional business

1. Report, Railroad Securities Commission, 1911 (of which President Hadley was Chairman), p. 18.

done on a given trading site. There is a more intensive use of a transportation agency built primarily to serve quite another kind of traffic. The additional business accrues as a result of effort by the railroad organization.

The established railway has advantages which, unless it shall be required to open its terminals to competitors, must normally be permanent. The elevators, distributing houses or manufacturing plants have located alongside the pioneer. The railroad which builds into an old country not only buys its land on the basis of a value dependent upon the presence of the older and competing line, but it also usually buys an inferior operating site. Compare, for example, the easy grade of the Cincinnati, Hamilton & Dayton out of Cincinnati with the steep grade and costly trestle construction of the Chesapeake & Ohio of Indiana, which as the old Cincinnati, Richmond & Muncie used the C. H. & D. tracks. The new line normally finds also the sources of income physically attached to its rival. An essential link in the dream of the Gould transcontinental was the West Side Belt which should give access to the industries of Pittsburgh. Without such access the agreement of Mr. Carnegie to give 25 per cent of the Carnegie steel tonnage meant nothing. And upon this tonnage depended the financial success of the Wabash Pittsburgh Terminal project. But even had the competitor proved able to bear the strain of the starving time, the position of the Pennsylvania in the Pittsburgh industrial area must still have been dominant.

Once the net earnings extend beyond the point which was necessary to induce the original investment, an element of "unearned increment" appears which is comparable with the unearned increment accruing in the economic rent of sites devoted to other than railroad purposes. The difficulty is that most of the reasoning upon this subject assumes a "natural" continuing increase in the value of land. The forces of cause and effect are ignored. But for railroad land, as for the building site or the farm, any increase in land value must be a result of earnings (economic rent) and not a cause. The rent for the corner of State and Madison streets in Chicago is not determined by the value of the site; the value of the site is determined by capitalizing the rent which the business men will pay for the corner. And so for the site of the railroad. How much the railroad can pay for its site depends upon how much more than interest on plan and equipment investment it can earn to apply as return on the land. At least the normal return must be expected to accrue or the carrier cannot afford to buy the site. Only if the total net earnings extend beyond the point necessary to induce investment do the excess earnings represent "unearned increment."

The Heart of the Valuation Problem

The heart of the valuation problem lies here. The regulation of earnings seeks to limit the amount of the revenue which may accrue by reason of the possession of a "water grade," a "canyon pass" or a "gap"; the possession of coal mines bought long ago at a low price, or by reason of the clustering together of traffic-furnishing industries or the development of traffic-producing intercarrier agreements. The railroads, perhaps unconsciously, have sensed the relationship of the proposal here stated in bald terms. They have insisted that the "final value" of the property as found by the commission must take account of the value-producing elements, even though these elements affect value (i. e., "selling price") either through increasing gross earnings or decreasing operating expenses. When Commissioner Daniels spoke of a value imparted to the Kansas City Southern as a whole by its Port Arthur Terminal, he was struggling with the same underlying difficulty. The railroad operates as a unit, and for other than local business the possession of an ocean terminal has been strategically essential in order to insure remunerative divisions. Financing the Western Pacific was presumably justified from the viewpoint of the Rio Grande security holders because it promised to add to the earnings of that property amounts then flowing into a competitor's treasury. The building of the west end connection therefore "promised to add a value" through fairer divisions of joint revenue and promise of greater contributions to eastbound transcontinental traffic. But the "added value" was to accrue from greater net earnings, real or anticipated.

The Texas Midland, Winston-Salem Southbound and Kansas City Southern opinions contain general statements testifying to the truth of assertions made by the carriers; traffic connections are listed; the density of traffic is summarized; the character of the adjacent country is described and its products classified; the maximum grade and curvature are stated. Even for the Texas Midland (which has never proved commercially profitable) it had been urged that a "value" should be found because of connections facilities and gradients. President Lamb indicated that investors would be influenced by the fact that the Atlanta, Birmingham & Atlantic "traverses a section of the country rapidly increasing in population and wealth." And the Elgin, Joliet & Eastern (the Chicago "Outer Belt") emphasized particularly "the density of the traffic over the railroad . . . by reason of its favorable location and connection with other railroads and industrial plants." But to appraise these elements as "value" in terms of dollars necessarily involves a consideration of earnings. These are the factors which govern earnings. Clearly they bear no relation to cost or investment. The truth is that the railroads, consciously or unconsciously, are proposing the capitalization of the net earnings which accrue through the possession of differential advantages—a capitalization of the economic rent accruing on the railroad site.

To measure earnings by a value based upon the differential advantages of the railroad site would deny the existence of an unearned increment in railroad earnings by increasing *pari passu* the value of the property. This is to step again into the vicious circle. But it serves to indicate the real "valuation problem"—to find a basis which can logically be used to determine the existence or non-existence of the "unearned" element in the total carrier net income.

There can be no other test than the test of investment, of cost. A return upon the cost of the carrier site is a necessary part of the "long run" cost of producing railroad service. Without the expectation of earning this amount there is lacking all inducement to furnish private funds for construction. It follows logically then that an "unearned" element appears in income only when railroad income extends beyond the point necessary to reward the skill and judgment exercised in its building. Why else, indeed, "unearned?"

If "cost" rather than value is significant for railroad land, what of the carrier plant? Obviously the value of the units on the market is a second-hand value—they are junk. It is again to be seen, therefore, that the term "value" is not appropriate. The figure to be secured, if the problem is to be analyzed into its logical elements, is a figure by which to measure that portion of the long run cost of producing transportation which accrues in net earnings. This holds for plant as for land.

Accounting records do not show the economic facts. To be sure property investment, the first item on the assets side of the railroad balance sheet, purports to indicate the amount of the investment which the railroad devotes to the public service. That the account is quite devoid of such significance is a matter of common knowledge. Too often, as originally set up, it has been hardly more than the journal entry to balance the par value of securities. Even had the first figures been substantially accurate, conservative management, preferring to err on the side of safety if at all, has swelled

the actual investment in plant through charges of net additions to operating expense. Or less significant management, perhaps less honest management, even less fortunate management, has permitted the original plant to wear out without changing the accounts.

It must be recognized, however, that when a large and varied plant such as a railroad is worn to a state of normal depreciation, a formal depreciation reserve is not needed except for clearer exhibition of the facts. Bookkeeping has been simplified by charging replacements to operating expense (maintenance) in preference to setting up a depreciation reserve against which replacements should be charged. The effect of this confusing short cut has been to create generally in the minds of railroad men the idea that they have a "right" to make needed replacements out of current earnings. This assumes that the entire cost of a new rail or car bought in 1919 is a part of the cost of producing transportation in 1919. As a matter of fact, the cost of the old rail (not the cost of the new rail, which represents instead new investment) has been properly chargeable against the cost of producing transportation throughout its service life. The cost of the *new* rail is not significant for cost of past service. Practice has omitted the formal credit to depreciation reserve, and if attending to the detail at all has assumed that the amounts spent for maintenance and replacements balanced the accruing depreciation. In the absence of depreciation charges, or when charges based upon an expected life of a hundred years have been made on equipment which will probably last less than thirty, that extensions or realignments have been paid for out of earnings does not, therefore, of *itself* prove that *net additions to investment* have been made. The income spent for fixed improvements may be that received in reimbursement for the wearing out of the plant made in the past. It is only when the amount of the maintenance cost in any one year, plus the amount spent for new plant, exceeds the accruing depreciation in plant not yet ready for discard that there is net addition to investment.

Maintenance, an operating cost upon the books, has been here spoken of as investment. This concept (although the reasoning has not been clean cut) is at the bottom of the railroad claim for appreciation of roadbed. Too frequently the evidence (expert testimony) has sought to show that the old roadbed is more "valuable" than the new roadbed, because maintenance expenses are less or a purchaser would be willing to pay more. But the essential point is that a railroad is not a finished product when the construction forces have turned it over to the operating department. There is still much work to be done "in resurfacing, in opening up clogged waterways and in bringing about an improved condition of roadbed, right of way and station grounds." And to the extent that this work represents a net addition to investment it may be said that an "appreciation" has occurred which is quite independent of earnings or "value" or of the method of handling the extraordinary expenses upon the books. When the commission falls back on its accounting categories the real underlying problem is passed over. That under the prescribed rules of accounting the carrier cannot carry any part of this expense into its investment account proves nothing conclusively, except that when tested by a refinement of economic theory the accounting rules are inadequate. The argument that "seasoning does not cost anything because it has all been paid for as operating expenses" is beside the point. The accounting rules of the commission are based upon the concept of maintenance in terms of operating efficiency and not of maintenance in terms of dollars of investment. No account is taken of any difference between the cost of the new unit and the original cost of the unit retired, an important consideration in a period of advancing prices, and especially important for those units of plant subject to frequent replacement.

Take the case of the locomotive. In the course of its service life parts are renewed from time to time. When the locomotive comes fresh from the shop it is the cost of the new wheel, or piston rod, or driving axle which constitutes the existing investment, not the cost of the original part which has become worn out and useless for productive purposes. The general manager of the Texas Midland spoke of one of his locomotives in the following terms: "There was not much of the original locomotive left except the outside shell of the boiler, the frame and the cylinders." The question thus resolves itself into the question of whether we are now interested in what the existing plant cost or what the original plant cost five, ten, fifty years ago. Which constitutes original cost to date, which constitutes investment? Obviously the cost of the existing unit.

"Cost to Date in Valuation"

Now, what of the valuation act and what of the commission? The act calls for the ascertainment and report in detail of the "original cost to date" of each piece of property. This requirement the commission has interpreted as demanding the report of a *fact* as contrasted with an *estimate*. The properties have been "actually produced in the past, and their production has cost a given amount of money." Provided the records suffice, original cost, "a fact of prime importance," can be exactly known, and it is in the "exact" sense that the words are interpreted by the commission. But the commission's accountants, finding it impossible to allocate costs to unit of plant, have shown a "kind of original cost" by seeking to determine the source of the funds spent for plant when units of plant have been added otherwise than as replacements charged to operating expenses. "When the proper retirements have been made the result is the original cost of the property in existence, assuming those retirements to have been all identified and the original cost properly determined." The difference between any amounts charged to operating expense because of a more expensive replacement in kind (a $1 tie instead of a 50-cent one) and the original cost of the original unit (the 50-cent tie) is assumed not to constitute investment, since it has been charged to operating expenses.

In substance, this is a proposal to accept the carrier accounts for operating expenses at the same time the property accounts are rejected as worthless. The inadequacy of accounting theory and practice would seem to apply equally to both. Because it could not be determined from the accounts whether one of the Texas Midland box cars had been built at the company's shops and the cost charged to operating expenses or whether it had been donated, no original cost for this unit of plant was reported. This is perhaps an extreme illustration, but it serves to bring out clearly the essential point of principle. The commission, seeking to differentiate between funds furnished by the corporation and those furnished by the public, fails to recognize that within uncertain limits set by a variable standard as to what constitutes the most economical operating condition (or from the other angle, what constitutes "deferred maintenance"), the carrier has had very real control over the disposition of its income. The public has not paid the operating expenses of the railroad in any different sense than it has paid the operating expenses of any other private business. The public has paid a price for service, and out of the total income, the disposition of which has been largely in the hands of the directors, appropriations have been made for dividends, for maintenance, for extension, etc. Once the income accrued to the private company its distribution, except as affected by safety regulations, has been determined by the private interest, and under private control. Heavy appropriations for maintenance, replacements and renewals (even for additional structures) have been made out of earnings, but the direc-

tors have had the choice of making such reinvestment of earnings or of distributing the earnings, including even the amounts properly representing the wearing out of equipment and plant. When dividends have been suspended, or interest repudiated, in order to put money back into the property, can it be said that the plant bought from earnings did not cost the owners anything because charged as operating expense upon the books? It would be different to convince holders of Boston & Maine or Rock Island securities that such a conclusion was valid.

The railroad surplus accounts call also for discussion. It is quite possible that a number of the railroad surplus accounts represent a mere surplus paper. When the present management of the Baltimore & Ohio took hold the surplus was written down to recognize accrued depreciation in equipment. In this sense the surplus represented really the accumulated depreciation reserve which practice had omitted. If in the past net earnings have been actually overstated through failure to charge the amount necessary to take account of depreciation—either through neglect of maintenance or failure to set up an adequate depreciation reserve, or both—any addition to surplus in that year has by so much been unreal. On the other hand, when net additions have been made through charges to operating expenses (in substance, where a secret reserve has been created) the surplus has been understated. In view of the haphazard mode of handling railroad accounts, therefore, the fact that a "surplus" account is carried on the books signifies nothing one way or the other.

How, then, determine the facts? How measure the total investment (cost to date) represented by the plant? Enough has been said to indicate the inadequacy of depending upon figures taken from the carrier books of account. Resort must be had to appraisal—appraisal in terms of the cost of the units in place, and appraisal of accrued depreciation. For, while an appraisal based on the cost of the units in place measures original cost to date, it does not measure unimpaired investment: the amount of original cost not used up in producing past service. An appraisal of accrued depreciation is still necessary in order to measure the amount of that cost which has been so used up; or, in accounting terms, to measure the depreciation reserve which would appear upon the books, did the accounts show the actual economic (and business) facts. That the Valuation Act calls for no analysis in these terms, but only a vague cost to date, is evidence of the further inadequacy of that legislation.

Objections to Using Cost of Reproduction

But may not cost of reproduction, which the Commission reports as a "fact" be taken as a rough measure of the investment? Much of the existing plant has been built or acquired during the period of price advance, and for such portions, original cost and cost of reproduction might well coincide within reasonable limits of approximation. But the approach of the Commission has been such as to render such coincidence purely accidental. The reproduction hypothesis would estimate the cost of building and equipping "as economically as possible under existing conditions—by a single continuous impulse." That "the present railroads of this country are the product of a process of gradual development," that "the narrow gage road has passed into the standard gage, and low class into the high class, the single track into the double track," that "grades have been improved, curves eliminated"—"all this is disregarded." Present conditions, present methods, present courses of materials, present prices; these shall govern.

Let the railroad disappear; and then let there be a "rational conception" of the process of reproduction. Such reproduction involves the securing of a charter and the raising of the needed funds. For simplicity it is assumed that the credit of all railroads will be equally good. Engineering parties must be organized and placed in the field; but through the country side, and in the heart of the great city, there is a long stretch of vacant land, corresponding to the exact site now occupied by the railroad. The engineer—instead of running preliminary surveys, indulging in "supposititious groping around the country"—is to walk to the exact spot where the road now exists, and to stumble at once on the best route.

Nor in fixing upon his construction program is he governed by the history of the road. This is an entirely new venture, where the uncertainties faced in original construction need not be faced. The watercourse which presented a problem at the time of original construction, but which (perhaps because of the change in drainage resulting from the building of the railroad) has since disappeared, presents no present difficulties. If a swamp has been drained, the present construction is through non-swampy land. Though actual construction began at the East end, he may begin at the West; though the original construction required four years, he may finish in three. None of those unforeseen happenings and conditions which, in preliminary estimates must be recognized by an allowance for contingencies need be considered. His materials for reproduction come from the most available present source, although it has been indicated that if there was not enough sand in the pits of the Texas Midland properly to ballast the road, it would be assumed, "for reproduction purposes," to have been put back. Ordinarily the reproduction is in kind. But, for the Atlanta, Birmingham & Atlantic, open hearth steel has been "substituted" for the Bessemer rail laid before the carrier had a Birmingham terminal, and for the Texas Midland, treated pine timbers have been "substituted" for the unavailable bois d'arc. Relay rails, however, are reproduced not "new," but as "relay"; and locomotives bought second hand are reproduced as "new" second hand locomotives.

The engineer's problem is further simplified by the fact that he has at his command, all existing means of transportation (except the road under reproduction), whether or not the competing and connecting lines were in existence when the road was built. The accident of ownership is therefore important. Had the Texas Midland been absorbed, say by the St. Louis Southwestern, the latter road would not, as now, be available to haul men and materials. Conceivably a different construction program, and a different cost or reproduction would result. Likewise if the Pacific Coast extension of the St. Paul had not been built, a different construction program for the Northern Pacific would be necessary, from the program now available. That line, extended as a pioneer, carried materials over its completed portion to the end of track. Now that the St. Paul is built, it can receive men and materials at many points along the line. And prosecution of the work simultaneously in many sections very much reduces the total construction period: an important consideration for the calculation of "interest during construction," itself a function of two variables both dependent on hypothesis and judgment.

Surely the indictment of cost of reproduction need not be carried farther. It is purely an artificial and hypothetical figure, bearing no real relationship to past sacrifices or present investment.

A Weight to Be Given "Intangibles"

The unfortunate presence in the court doctrine of the word "value" has caused further difficulty in the consideration of "intangibles." Surely a business man would pay more for a going concern than for one without established external and internal organization. And when a business is taken over by the government should not something be allowed for the fact that these relations exist, and that a preliminary

starving time has been passed through? One might answer these questions in the affirmative, and still be no nearer a solution of the problem of securing a measure of reasonableness. At first the Commission found "no other values or elements of value . . . . to exist," a finding which in more recent reports has been modified to read that "no other values or elements of value to which specific sums can now be ascribed are found to exist." How to determine the value of the "intangibles" is still an open question.

The carriers have proposed a subtraction program. Let the value of the property as a whole be determined; and then subtract from this amount the "physical value." The amount (if any) remaining constitutes the "value" of the intangibles. But this assumes that this intangible value is a result, and not a cause, and calls for an independent determination of total value. It is signficant that no method of determining total value has been suggested except the capitalization of earnings. Elements of value have been suggested; and the Atlanta, Birmingham & Atlantic insisted that a denial of the existence of "other values," and a report, in the same document of interchange facilities, terminals, expanding traffic, and favorable grades, constituted a contradiction. The criticism is at least pertinent. What is the function of data reflecting the forces which make for earnings if no "values" are assigned? That the Commission should have changed the form of its tentative finding is perhaps indicative that the line of reasoning suggested in these terms is making itself felt. But this argument is none the less circular; none the less fallacious, as was demonstrated in the discussion of land values. Earnings cannot be tested by a value dependent upon earnings.

What of cost? Much of the expense of attaching the customer (whether he purchases coal, or gas, or ton-miles) is incurred once for all at the beginning. And so is a portion of the expense to create a functioning organization. Business practice has not set up any part of these first costs as "deferred assets," presumably aiming, in the interest of conservatism, to over-state, rather than run the risk of understanding current operating expenses. But from the point of view of economic analysis, there is no reason why such a "deferred asset" account might not have been set up, to measure the amount of any cost properly spread over the future.

Such an account would not, however, measure a permanent level of "investment." It would be necessary each year to charge off a *pro rata* share. The situation is parallel with that presented by the charge against current earnings to compensate the depreciation of fixed assets. Some part of selling the product, ton-miles or passenger miles, consists of the cost of making the particular sale. There is a turnover in the organization personnel. Some of the effort fails entirely of result, like the effort expended in making a machine which proves useless. There may also be some very real investment. The expense of bringing settlers to the tributary country, of securing an industry to locate along the line of the railroad, is such an expense as might be chargeable against income subsequently accruing. But in the absence of records or attempt by the companies to carry such accounts, the task of "appraising" the intangible must be a delicate one. In the face of active competition, it would seem that the largest part of "traffic expense," for example, is not to be spread over a period of years. Present solicitation, present effort to get business, is probably in largest measure chargeable against the returns from that business. But that some amounts might be recognized as costs of securing the permanent relations may, nevertheless, be granted.

"Unimpaired Investment" the Correct Basis

The conclusion to be drawn from the foregoing discussion is that the figure of "final value" reported by the Interstate Commerce Commission should seek to approximate the *unimpaired investment* cost of existing units in place, less accrued depreciation. Not the cost of the locomotive boiler which has worn out; not the amount derived from the sale of securities; but the cost of the railroad property now devoted to the transportation service, whether charged to operating expense (maintenance), or to investment: this is the significant element. To this sum can be added "intangibles": any cost of organization such as the cost of the franchise, the right to operate, any cost of establishing business relations not yet fully depreciated.

But neither the Act itself, nor the attitude of the Interstate Commerce Commission (i.e., the Bureau, for to this time the Commission has practically "rubber-stamped" the recommendations of its Bureau of Valuation) promises that a figure of "value" will be found, which would meet the test of economic theory, as the theory has been presented in this paper. Certainly the totals now being published as tentative valuations offer no basis for a figure of "final value" founded upon sound economics. They represent a nominal compliance with a statute, as that statue has been interpreted, but they represent nothing more. It is too early to say that the Commission will not fulfill the promise to state single figures of value. It is even conceivable that the sum of cost of reproduction and the "present value" of land may in some cases be so reported. But it is not too early to raise the question of the real scientific validity of such figures (or any other figures reported) when based upon a "judgment" purporting to consider the irreconcilable totals and elements made final in the preliminary opinions. Any value, based upon the set of "underlying facts" as made final in the preliminary opinions, must be an arbitrary figure, however stated in the opinion of the Commission. Perhaps the very requirements of the Act make this inevitable.

This conclusion, if valid, pulls the props from under the assumption which is at the base of the proposal to regulate profits. It has been assumed that the Interstate Commerce Commission will determine figures of value. And it may do so without regard to the relevancy of the premises. But one thing is clear, that if, upon these "values", rates are to be adjusted to limit profits, the result will be anything but scientific. The return to the carrier is a part of the long run cost of producing transportation. This amount should then be measured in terms consistent with the expectation of the investor. It is in terms of cost, of investment, that the business man makes his decisions involving original construction, replacements, and extensions. Of the amounts spent, no inconsiderable portion is sunk once for all. The grade, the tunnels, the concrete abutments and retaining walls, can never be used except in the place where originally built. The result of this initial investment (in that great multitude of cases a permanent investment) is the large importance of the element of the return to investors in the cost of transportation. For the moment, this element may be ignored since it is advantageous to operate the railroad which is built, even though less than the return necessary to tempt investment is secured. This is the risk of business. But, in the long run, the reward for investing, assuming risk, directing enterprise, must be met in the case of the railroad which could justify building.

This again raises fundamental issues. For promise of a profit greater than that now needed to attract investment in a well-established railroad was originally necessary to attract the investors of the earlier days who undertook pioneer risks. Once the enterprise has become profitable and the risk in part eliminated for future investors, shall it be conceived that only a return sufficient to attract this future investment is reasonable, that anything more than this amount represents excessive profit? Less than this would mean a check to railroad enterprise and to the further development of facilities. But can it be said that this minimum, so broadly

stated, represents a *reasonable* return under the set of circumstances to be considered, that anything in excess represents extortion—"monopoly profit"? On the contrary, there are circumstances when a "reasonable return" is something more than "one which under honest accounting and responsible management will attract the amount of investor's money needed for the development of our railroad facilities." More than this amount is not always "an unnecessary public burden", even though it be granted, with the Railroad Securities Commission, that "less than this means a check to railroad construction." And the conclusion follows because so considerable portion of railroad investment represents pioneer risks. In those enterprises in which there are risks of great losses—surely railroad history would bear out the inclusion of railroads in this category of ventures—there must be hope of gain.

Causes of Differences in Earnings

One further point: existing railroads do not represent the same exercise of judgment in original planning, the same efficiency in creating and maintaining an organization, in establishing relations with shippers and passengers, in solving operating problems. Clearly focused are seen the forces which create a differential element in earnings. It is difficult to say how much of this differential is "profits", how much "economic rent", though how the differential accrues to the better located, better managed roads can be readily indicated. The differential is due to natural conditions (a "water grade", or the possession of a canyon pass, for example), to "social" causes (the increasing of population, the clustering together of allied branches of industry), or to superior management. The actual income is a resultant of these forces. It is the old question of the New York Central and the Pennsylvania, the one operating through river valleys and along the lake shore, going around the mountains, the other cutting through. An extra gain comparable to a site rent appears, as a reward for skill in original location,—perhaps even for the one company having first dared to risk the cost of building. The "legitimate" differential return in profits, whether due to judgment in picking an original line which possesses superior operating conditions, or to subsequent active management in building up an efficient organization, or in establishing satisfactory relations with the shipping and traveling public, is intermingled with any return above the costs necessary to induce promotion and management of high grade. To bring American railroad service to its present preeminent place has required courage, imagination, skill of the highest order. The emphasis upon the important investments in railroad plant which are now being made—track elevation, passenger terminals—as "unproductive" indicates the presence still of a considerable risk element.

But entirely aside from the question of the practicability of disassociating an element of "unearned increment" in the return to the railroad, is a broader challenge which looks to the validity of appropriating this increment either through taxation or reduction of charges. The power of regulation, alone, hardly warrants reduction of rates simply because the tendency exists for railroad net earnings to increase in proportion to the investment. That the railroad is a common carrier, that the furnishing of transportation is a "public" business, only accounts for regulation. By itself it does not justify a deliberate attempt to capture the "unearned increment' on one class of sites. To appropriate the "unearned increment" (if any) which accrues to the railroad with the increase of traffic may represent a desirable policy for the community to adopt. But that it is more desirable than the appropriation of the "unearned increment" which accrues in the rent of lands devoted to other purposes one may well be skeptical.

But the American people have not passed upon the proposal to regulate profits. "Valuation" was thought necessary by the body to which is committed the regulation of the railroads in order to combat claims made by the companies. In response to urging by the Interstate Commerce Commission, which at no time appears to have made a rigorous analysis of the underlying economic problem, Congress passed the "Valuation" Act, with its miscellaneous provisions. The Act is not in any sense an expression of a policy. And investigations for which it provides can furnish nothing of even temporary usefulness in solving the inherent problem of justice. An economic problem cannot be solved by a judicial formula.

An Improved Track Spike

INCREASED HOLDING POWER, longer tie life against destruction of wood fibers, a lower cost of maintenance, a longer spike life against mechanical wear, a low cost of installation and extraction with unskilled labor and a low ultimate cost are advantages claimed for the Sessler-Grip-Spike which has recently been placed on the market by the American Spike Company, New York. While embodying radical changes in design, this spike requires no change from the ordinary spike in the method of application. It has a fluted twisted shank, a round head not unlike a screw spike with the nut portion removed, and a weight of one pound. It is made of steel, with specifications exactly as those outlined by the American Railway Engineering Association, and is furnished in standard kegs of 200 lb. each.

In a series of comparative tests made by the Engineering Laboratories of Columbia University, an abstract of the results of which was published in the *Railway Age* for December 26, 1919, page 1237, this spike was shown to average over the entire half-inch withdrawal in all conditions, in all ties, about 42 per cent greater resistance to vertical pull than the cut spike used by the Pennsylvania Lines West, which measured 6 in. under the head and 5/8 in. in cross section. The unusual holding power of the Sessler-Grip-Spike is due to three elements of design:

The Spike Cuts the Wood Fibers

(1) It has a surface area in the same length of shank over 25 per cent greater than the cut spike used in the tests.

(2) Its point is divided into four flat walls, which extend 1 in. back on the shank. Any tendency to turn these walls to the smallest degree meets with a marked resistance of these four flat walls against the wood fibers packed between them. The rebounding of the rail has a tendency to pull up a spike. In coming out, the Sessler-Grip-Spike would naturally fol-

low the pitch of its twist, but, due to the fact that the point prevents its following this pitch, the pull of the Sessler-Grip-Spike is directly upward without any rotation whatsoever for the first ¼-in. movement. Consequently, the flat-sided flutes bear directly against the undisturbed fibers, which, being in their original elastic state, press back the spike into its original position without any appreciable movement or permanent set of the spike in the tie.

(3) In driving this spike its rounded surface compresses the fibers instead of crushing or abrading them downward. The practically undisturbed condition of the wood fibers presents a greater resistance to lateral thrust than is the case with wood fibers broken down. Lateral thrust is in itself determined by three factors: (1) The condition of the wood fibers at the neck of a spike; (2) the form of cross-section at the neck of a spike; (3) the resistance to upward pull. When the wood fibers are crushed down about the neck there is little resistance to the side thrust against the throat of the spike, as is the case with the cut spike, while when the fibers are not crushed down there is a great resistance to their displacement to side thrust. This is the case with the Sessler-Grip-Spike.

The square cut spike has less resistance to bending than the circular cross section, while the bending backward of a spike due to lateral thrust is likewise accompanied by a certain amount of upward pull, which results from the bending backward of the member. Insofar as the resistance to upward pull of the Sessler-Grip-Spike is greater than that of the cut spike, it claims this advantage.

A marked reduction in wood fiber destruction is obtained

The Spike Has a Fluted, Twisted Shank

with the Sessler-Grip-Spike. A cut spike driven into a tie without first pre-forming the hole, crushes and bunches the fibers over a wide area, due largely to the splitting and wedging action being confined to one plane. With the Sessler-Grip-Spike this splitting action appears to be less, due partly to the shape of the point, which tends to produce a combined cutting and splitting action, but much more to the rotation of the spike on driving, averaging 63 deg. when driven without a hole and 68 deg. when driven into a hole. Due to this rotation of the spike, the splitting and wedging is not confined to any one plane, and the cumulative effect upon the wood fibers appears to be reduced thereby.

The following is quoted from pages 46 and 47 of the Columbia bulletin: "Within the elastic withdrawal limit the resistance to direct pull developed by a spike is directly proportional to the displacement of the spike in the wood. Also within the elastic withdrawal range the permanent set is practically negligible.

"It is obvious that the least number of spikes and greatest efficiency per rail fastening will be obtained with that type of spike having the highest elastic withdrawal resistance.

"Based upon the results of these tests the relative average elastic limits of the Sessler-Grip-Spike was 129 per cent, assuming the cut spike at 100 per cent. This elastic withdrawal limit is the loading below which no permanent or appreciable movement of the spike in the tie takes place and is the point beyond which permanent sets are induced and the frictional resistance of the spike in the tie is decreased. This means that the higher the elastic withdrawal limit the less the number of spikes necessary to obtain a permanent track structure."

Spikes affect tie maintenance in (1) the frequency of tie replacements, and (2) in the frequency of hammering down the spikes after they have worked upward. Tie placements are largely governed by the mechanical wear, as above mentioned. The frequent redriving of the cut spike is due to its comparatively low initial holding power or elastic withdrawal resistance, and its materially reduced holding power by successive redriving. The Columbia University tests show that in practically every instance the third withdrawal of the Sessler-Grip-Spike is as good and frequently better than the first withdrawal of the cut spike. This means that the Sessler-Grip-Spike would have to be redriven but once, if at all, where the cut spike would be redriven three or more times. Spike redriving is also governed by the moisture contained, which gradually rots the broken fibers around the spike shank. Moisture is very largely excluded by the spike shank of the Sessler-Grip-Spike which closes and seals the paths made by the fluted shank.

In replacing rails the maintenance costs to be considered comprise the withdrawal and replacing of spikes and the gaging of track. Sessler-Grip-Spikes are driven with the ordinary spike maul and are extracted with the ordinary claw bar. Both these costs are therefore the same as they are with the cut spike.

When the throat of a cut spike becomes worn the head either bends backward, due to lateral thrust on a weakened cross-sectional area, or the head snaps off in cold weather. The wear on the throat of a Sessler-Grip-Spike is reduced because of the limited amount of withdrawal that takes place on account of its higher holding power and higher elastic withdrawal resistance. Its cross-sectional area has a greater resistance to backward bending. In addition to this, the Sessler-Grip-Spike can be re-used numerous times because of its round throat and head, which permits its withdrawal and re-insertion in a slightly different position.

From the Birmingham (Ala.) Age-Herald

Isn't He Just a Little Spoiled?

General News Department

The Brotherhood of Locomotive Engineers and the Order of Railway Conductors have decided to join the American Federation of Labor next month, according to a statement of Samuel Gompers, president of the A. F. of L.

Employees of the Pennsylvania Railroad belonging to the National Guard may have two weeks' leave of absence without loss of pay or of annual vacation privilege, wren required to take time for field training. This is the substance of a resolution which has been adopted by the directors of the road.

The annual convention of the National Association of Railroad Tie Producers, which was originally scheduled to be held in Chicago on February 12 and 13 and which was postponed at that time because of the influenza epidemic, will be held at the Hotel Sherman, Chicago, Thursday and Friday, April 22 and 23.

The American Railway Engineering Association, through its committee on personnel, has sent a letter to the members of various committees of that organization asking for suggestions regarding personnel for the ensuing year. The entire subject of committee organization is now being given careful consideration by the board of direction in order that the increasing membership may be given representation and a part in the work of the association.

Graduates in engineering of Cornell University will meet on the evening of April 9 in the Engineering Societies building, New York. A meeting has been called by the Cornell Society of Civil Engineers, partly with the idea of forming a general Cornell engineering society, now that the different engineering schools at Cornell are to be combined into one general engineering college. The new dean of the combined college, Professor Dexter S. Kimball, will be one of the speakers.

A strike of clerks on the Norfolk & Western, on March 22, blocked freight office work at Norfolk and also at some other points, to the extent that a partial embargo on freight shipments was placed at Norfolk on March 26. The strikers' grievance appears to have been local and to have been disapproved by general officers of their union; but the strike was still on at the time of going to press; and the shopmen in the large shops of the road at Roanoke, Va., struck in sympathy with the clerks, on the 31st. The shop strikers claim that 5,000 men were out.

Congestion of cotton at Boston has become so serious that importers are asking the government to suspend temporarily the requirement that cotton from Egypt be fumigated at the port. It is estimated that the two fumigation plants at Boston, which have a capacity for about 2,500 bales a day, are two months behind in their work. Ships which have been in port a month are still waiting to discharge their cargoes. One cause of congestion has been the shortage of freight cars, and cotton has been carried by automobile trucks from Boston to Fall River, 50 miles, and New Bedford, 56 miles, as well as to other places less distant.

The Roswell Railroad, extending from the Southern Railway at Chamblee, Ga., northward ten miles to Roswell, has suspended operations, and Judge Bell of Fulton County Superior Court has appointed Henry Troutman receiver. This road was operated by the Southern Railway, but on the termination of federal control, train service was suspended, the Southern finding that, because of increasing costs and the competition of automobiles, there was a constant heavy deficit. The Railroad Commission of Georgia ordered the Southern to resume the operation of trains beginning March 29, but an injunction was obtained from the Court restraining the enforcement of the order. Following the issuance of the injunction the receiver was appointed.

An attempt to wreck Chicago, Burlington & Quincy westbound train No. 5 was made on the evening of March 26, soon after the train left Chicago, carrying an express shipment valued at $150,000. Acting upon a tip that a hold-up was contemplated, the train was switched to the eastbound track, near Neponset, Ill., and it safely passed a large pile of ties placed on the westbound track. The suspicions of farmers living in the vicinity of Neponset were aroused earlier in the day by inquiries made by strangers and the appearance, on the evening of the attempted wreck, of four unknown men. The farmers later notified police officers, who in turn notified the road's special police. Search is now being made for the strangers.

A. R. Urion, chairman of the committee on refrigeration of the Michigan State Horticultural Society in a recent address before that organization at St. Joseph, Mich., stated that farmers and fruit growers were facing a serious situation resulting from the shortage of refrigerator cars in that district. According to Mr. Urion, the present shortage of cars approximates 6,000. This shortage, it is alleged, had existed since the railroads went under federal control and no replacements have been made since that time. Following these statements the meeting went on record as being in favor of making a special appeal to the government to intercede in their behalf toward obtaining the necessary cars.

The Employees' Mutual Relief Association of the Long Island Railroad now has a membership of more than 8,000, which is greater than the number of persons employed by the railroad, the explanation of this discrepancy being that employees who have left the service of the road retain their membership, when desired, by the payment of regular dues. At the present time there are about 1,500 members who are out of the service. In 1919 benefits amounting to $83,370 were paid to 1,150 members and to the families of 89 members who died from natural illness or accidents. This relief association was organized on February 1, 1886, and in the 34 years of its existence has disbursed to members and their families or dependents approximately $1,500,000.

The contention of members of the Brotherhood of Locomotive Firemen and Enginemen employed on the Canadian National Railways that the period of duty after which trains may be laid up between terminals for firemen to obtain rest should be reduced from 15 to 12 hours, has been sustained by the Canadian Railway Board of Adjustment No. 1. The employees contended that the present 15 hour optional rest rule was agreed to several years ago and when small power was in service and good grades of fuel were being used. Since that time the power has increased and engines are now hauling twice the tonnage hauled at that time and with inferior grades of fuel. The railways contended that no hardship exists under the present rule inasmuch as the work of the fireman is being reduced by the equipment which is now being applied to locomotives.

Political Activities of the Plumb Plan League

The Plumb Plan League has sent a questionnaire to all candidates for the presidential nomination asking them to state for publication in "Labor," the league's newspaper, the source of their campaign funds, but it does not promise to reciprocate by disclosing information as to its own campaign funds. "Labor" has also called upon railroad men in Wisconsin to support the La Follette Progressive Republican ticket and to defeat Senator Lenroot and Representative Esch because they voted for the railroad bill.

The railroad transportation brotherhoods are not joining the political campaign of the American Federation of Labor, but

are working along their own lines. On the other hand, the A. F. of L. is taking no part in the propaganda for the Plumb plan or government ownership of railroads.

New England Railway Club

At the next meeting of the New England Railroad Club to be held in Boston, Mass., on April 13, a paper will be presented on the subject of Accounting by William J. Cunningham, Professor of Transportation at Harvard University.

Correction

J. L. Cone, grand president of the Railroad Yardmasters of America, advises that he was misquoted in the report of the hearing before the Interstate Commerce Commission regarding the classification of subordinate officials in the *Railway Age* of March 19, page 964. The report indicated that Mr. Cone considered the general yardmasters as officials, whereas he says that he asked that all yardmasters, general and otherwise, be termed subordinate officials.

Pacific Railway Club Elects Officers

At its annual meeting held in San Francisco, Cal., on March 16, the Pacific Railway Club elected the following officers for the ensuing year: President, Dennistoun Wood, assistant mechanical engineer and engineer of tests, Southern Pacific; first vice-president, G. H. Harris, general superintendent, San Francisco—Oakland Terminal; second vice-president, F. S. Foote, Jr., professor of railroad engineering, University of California; treasurer, G. H. Baker, assistant general freight agent, Atchison, Topeka & Santa Fe; secretary, William S. Wollner, general safety and welfare agent, Northwestern Pacific.

Following the election of officers, Samuel O. Dunn, editor of *Railway Age*, delivered an address on "The Future of the Railroads."

A Real Grievance—Gross and Net

"GROWLERVILLE, N. J., February ——.

"D. L. W. Co., Gentlemen:

"After I left your office my car of cattle was weighed and placed on rear end of train which was wrong, as it jerks and throws the cattle and damages them to a great extent. My cattle drank considerable of your water when in yard, and the hay I placed in the car, when you weighed the car, and I payed freight on the hay and water, which looks to be wrong. When I loaded these cattle they were full, then they droped in that car and then they filled up again on water and I had to pay on the freight on over-weight, which I think is very wrong. I wish you gentlemen would look into the matter and think of it right or wrong to pay for so much water. I wish you would look the matter up and write me." (Signed)

H. W. S——.

Uses for for Confiscated Railroad Earnings

Roberts Walker, discussing the Transportation Act, and referring to that part of the law providing for the confiscation of a part of the income of railroads above 6 per cent, says: "Railroads are as great a public need whether they run through tortuous defiles or over wide farm lands, and not all of the differences between the prosperous and the poor roads arise from better management or other human factors. It is thus possible that the confiscation of part of the income in excess of 6 per cent will be held warranted, on the ground that in no other manner can disparities in geographical situation and physical conditions, no less than disparities of management, be ironed out and placed upon a footing just to the public as a whole. And if the court should not so decide, a ready method of reaching the same result exists through the use of the taxing power."

Engineering Advertisers' Association Elects Officers

The following officers of the Engineering Advertisers' Association of Chicago were elected for the ensuing year at a meeting held at Chicago on March 9: President, A. H. Hopkins, advertising manager, C. F. Pease Company; vice-president, J. J. Arnsfield, advertising manager, Fairbanks, Morse & Co.; secretary, G. S. Hamilton, advertising manager, American Steam Conveyor Corporation; treasurer, E. I. Pratt, advertising manager, Kellogg Switchboard & Supply Company.

The following directors were elected to serve two years: L. L. Gerstenberger, assistant general manager, Imperial Belting Company; J. B. Patterson, district manager, P. H. & F. M. Roots Company; G. H. Eddy, advertising manager, Green Engineering Company.

The retiring president, H. L. Delander, advertising manager, Crane Company, was elected ex-officio member of the Board of Directors.

Division of Purchases Discontinued

The Division of Purchases of the United States Railroad Administration was discontinued on April 1. Henry B. Spencer, director of the division, who has been elected president of the Fruit Growers' Express Company, will become an advisory member of the director general's staff with respect to matters growing out of purchases during the period of federal control of railroads. Such portions of the work of the Division of Purchases as remain to be completed after April 1, with the exception of the completion of activities incident to control over the distribution of coal, will be under the direction of the Division of Liquidation of Claims; Max Thelen, director.

Control over the distribution of coal, growing out of the strike of bituminous coal miners, was ended on April 1, in accordance with an executive order of the President. Any work remaining to be done in connection with the winding-up of the matters relating thereto will be dealt with in the director general's office, through Brice Claggett, assistant to the director general.

National Federation of Construction Industries

The first annual meeting of the National Federation of Construction Industries was held at the Hotel Sherman, Chicago, on March 24 and 25. Morning and afternoon sessions were held on both days of the meeting. The afternoon session of the first day was devoted to the general subject of "Freight Traffic." W. S. Dickey, president of the W. S. Dickey Clay Manufacturing Company, Kansas City, Mo., and chairman of the Federation's transportation committee, presided over the session. A. G. Gutheim, assistant manager of the Commission on car service; E. Guy Sutton, secretary of the National Association of Sand and Gravel Producers, Indianapolis, Ind., and Robert C. Wright, general traffic manager of the Pennsylvania, were the principal speakers.

Mr. Gutheim urged the material men to be patient with the present freight service, declaring that it would be six months before any appreciable betterment in conditions becomes apparent. Mr. Sutton declared strikes among the railway brotherhoods will probably be called in September, after the government has relinquished control over wages.

"The guarantee of 5½ per cent under the Esch-Cummins bill will not work out in favor of the shippers because the incentive for enterprise is nullified," he said. "A further increase in freight rates will call a halt in the building of homes because the freight rates on building materials are too high proportionately even now."

The Federation staff council meeting was held on March 26, following the annual meeting.

North Western to Pay for Highway Relocation

The most important case yet to come up under the Wisconsin law which authorizes the state railroad commission to assess benefits against a railroad company where improvement, relocation or reconstruction of a highway grade crossing of a railroad diverts a material portion of the traffic so as to eliminate danger, was determined by the Wisconsin Railroad Commission recently. The Wisconsin Highway Commission submitted to the Railroad Commission a plan for so relocating a portion of Sheridan road in Racine County as to make possible the elimination of two highway crossings of the Chicago & North Western and the substitution of another crossing.

The two crossings in question are on one of the most heavily traveled highways in the state. The North Western at these points is doubled tracked and there are frequent train movements at high speed.

The Railroad Commission, in its findings, states that were it not for the changes proposed by the Highway Commission a separation of grades would have to be made to provide for the reasonable safety of the traveling public. "By relocating the highway," said the Railroad Commission, "such a reduction in the traffic on the crossings in question will be accomplished that a far less costly method of protection will be reasonably adequate and the possibility of a grade separation extremely remote." The order of the Railroad Commission directs the Chicago & North Western to pay the sum of $29,000 into the state treasury, and when the relocation is accomplished the railroad company must install at each of the two crossings automatic signals in place of the flagmen now required.

Storms and Tornado Tie Up Traffic

Two violent storms, one originating in Alaska and moving southeast across the United States, and the other originating in the plains of Nevada and Arizona and moving northeast, have resulted in tying up railroad traffic in the west and, meeting, formed a tornado which caused serious damage and loss to railway equipment and facilities in the vicinity of Chicago. The Alaskan storm, sweeping across southern Minnesota, South Dakota, Montana, northern Iowa and northern Wisconsin, effectively tied up traffic and necessitated detouring Chicago, Milwaukee & St. Paul trains over the Northern Pacific, between Minneapolis and Miles City, Mont. Snow blockades were frequent in this territory and trains were operated with difficulty on the Great Northern, Northern Pacific, and St. Paul. The Alaskan storm, upon reaching the central west, was met by the storm which originated in Nevada and Arizona and resulted in the creation of a tornado, which swept across the suburbs of Chicago, destroying large portions of Elgin, Ill., Melrose Park, Willimette and other smaller suburbs and seriously affecting train service in the two-hour period, during which the storm was at its height in this vicinity. The total amount of damage to railway equipment has not been determined as yet, although it is believed that the partial demolition of station houses and other stationary equipment will be costly.

Daylight Saving

"Summer Time" was adopted in New York City last Sunday, and also quite generally in surrounding cities and towns; but many people were confused because a part of the railroads changed their timetables (retaining 75th Meridian time) and part changed their clocks. The New York, New Haven & Hartford, and the New York Central issued new timetables, changing large numbers of suburban trains, morning and evening, to times about one hour earlier than they were; many of the changes being, however, not in hours because of the dense traffic and the necessity of adjusting the schedules between those of other trains not changed. The Delaware, Lackawanna & Western issued a supplement, advancing suburban trains on the Morris & Essex division to the extent of one hour. The Long Island, the Erie and the Central of New Jersey changed their clocks. The Central of New Jersey, however, had to issue a supplement to its timetables because of trains which run through to and from Philadelphia over the Philadelphia & Reading, which retained standard time. On this line there is now a new train from Philadelphia to New York, starting at 6 a. m., to take passengers who desire to reach New York at 8 a. m., standard time, equivalent to 9 a. m. New York summer time. The train leaving Philadelphia for New York at noon has been changed to start at 11 a. m., Monday to Friday, inclusive. Similar changes have been made in certain westbound trains and in others affected by the change in New York City.

The Pennsylvania, continuing to use the time of the 75th Meridian, has advanced by one hour the time of suburban trains to and from New York within the territory bounded on the west by New Brunswick, N. J., and on the south by Point Pleasant. No changes were made in the schedules of trains running to or starting from points west of New Brunswick.

The legislature of New York is almost evenly divided in sentiment; and, as we go to press, is still discussing a bill to repeal the state law. This law corresponds to federal law, except that the section requiring changes spring and fall has not been repealed. Members of the legislature who are working in the interest of farmers who are opposed to the use of summer time, threaten to appeal to the courts to declare the state law unconstitutional, as being in conflict with the federal law on standard time, which makes the adoption of "summer time" illegal. This federal law, however, prescribes no penalty for disobedience; so the railroads which have acted in disregard of its provisions are not likely to be called to account, unless some district attorney should institute proceedings for a mandamus. The post offices and the federal courts in New York City have set their clocks ahead an hour. That section of the law affecting these offices simply requires that statutes, orders, etc., relating to the time of performance of any act by any officer of the United States, * * * or relating to the time within which any rights shall accrue, * * * shall be denominated in accordance with standard time. It does not say how clocks shall be set.

The railroads of Canada, conforming to the action of their connections extending into the United States, continue the use of standard time.

Meetings and Conventions

The following list gives names of secretaries, dates of next or regular meetings and places of meetings:

AIR BRAKE ASSOCIATION.—F. M. Nellis, Room 3014, 163 Broadway, New York City. Next convention, May 4-7, Hotel Sherman, Chicago.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, Supervisor of Demurrage and Storage, C. & N. W. Ry., Chicago.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—S. W. Derr, C. R. R. of N. J., Philadelphia, Pa.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, Illinois Central, Chicago. Next annual meeting, June, 1920.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. R. Reynolds, C. G. W. R. R., Chicago.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—J. Rothschild, Union Station, St. Louis, Mo.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 8 W. 40th St., New York.

AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.—C. F. J. Dell, 50 E. 42nd St., New York.

AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPE FITTERS' ASSOCIATION.—Otto E. Schlinck, 185 W. 5th St., Peru, Ind.

AMERICAN RAILROAD ASSOCIATION.—J. E. Fairbanks, 75 Church St., New York:

Section I, Operating (including former activities of Association of Railway Telegraph Superintendents).—W. J. Fripp (chairman), N. Y. C. R. R., New York, N. Y.

Telegraph and Telephone Division.—J. F. Caskey (chairman), Supt. of Telegraph, Lehigh Valley.

Section II, Engineering.—E. H. Fritch, 431 South Dearborn St., Chicago.

Signal Division.—H. S. Balliet, 75 Church St., New York.

Section III, Mechanical (including former activities of Master Car Builders' and Master Mechanics' Association).—V. R. Hawthorne, 431 South Dearborn St., Chicago. Next convention, June 9-16, 1920, Atlantic City, N. J.

Section IV, Traffic.—Robert C. Wright (chairman), Assistant Director, Division of Traffic, U. S. R. A., Washington, D. C.

Section V, Transportation (including former activities of Association of Transportation and Car Accounting Officials).—E. J. Pearson (chairman), Federal Manager, N. Y., N. H. & H. R. R., New Haven, Conn.

Section VI, Purchases and Stores (including former activities of Railway Storekeepers' Association).—J. P. Murphy, N. Y. C. R. R., Collinwood, Ohio. First annual meeting, June 14-16, 1920, Atlantic City, N. J.

Section VII, Freight Claims (including former activities of the Freight Claim Association).—Lewis Pilcher, 431 South Dearborn St., Chicago.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W. Ry., 319 N. Waller Ave., Austin Station, Chicago. Next convention, October 19-21, 1920, Atlanta, Ga.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—(Works in co-operation with the American Railroad Association, Section II.) E. H. Fritch, 431 South Dearborn St., Chicago.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—(See American Railroad Association, Section III, Mechanical.)

AMERICAN RAILWAY PERISHABLE FREIGHT ASSOCIATION.—E. F. McPike, 135 E. 11th Place, Chicago. Regular meetings, 2nd Wednesday in March and September.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—R. D. Fletcher, 1145 East Marquette Road, Chicago.

AMERICAN SOCIETY FOR TESTING MATERIALS.—C. L. Warwick, University of Pennsylvania, Philadelphia, Pa. Next annual meeting, June 21, 1920, New Monterey Hotel, Asbury Park, N. J.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Col. H. S. Cracker (acting secretary), Engineering Societies Building, 33 W. 39th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 33 W. 39th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.

AMERICAN STEEL TREATERS' SOCIETY.—W. H. Eisenman, 154 East Erie St., Chicago.

AMERICAN TRAIN DESPATCHERS' ASSOCIATION.—D. L. Darling, Northern Pacific Ry., Spokane, Wash.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, B. & O., Mt. Royal Sta., Baltimore, Md. Next annual meeting, February, 1921, San Francisco.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—Willis H. Failing, C. R. R. of N. J., Jersey City, N. J. Next meeting, May, 1920, Atlantic City.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago.

ASSOCIATION OF RAILWAY EXECUTIVES.—Thomas De Witt Cuyler (chairman), 61 Broadway, New York, N. Y.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—(See American Railroad Association, Section I, Operating.)

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—(See American Railroad Association, Section V, Transportation.)

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—G. R. McVay, Barrett Company, Chicago.

CANADIAN RAILWAY CLUB.—W. A. Booth, 131 Charron St., Montreal, Que.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 626 North Pine Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, New Morrison Hotel, Chicago.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS.—Thomas B. Koeneke, Federal Reserve Bank Bldg., St. Louis, Mo.

CENTRAL RAILWAY CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meetings, 2d Thursday in November and 2d Friday in January, March, May and September, Hotel Statler, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—J. C. Keene, General Car Inspector, Wabash R. R., Decatur, Ill.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S SUPPLY MEN'S ASSOCIATION.—D. B. Wright, Lehon Company, 45th and Oakley Sts., Chicago.

EASTERN RAILROAD ASSOCIATION.—D. G. Stuart, Washington, D. C.

FREIGHT CLAIM ASSOCIATION.—(See American Railroad Association, Section VII, Freight Claims.)

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Sta., Chicago. Regular meetings, Wednesday preceding 3d Friday in month, Room 856, Insurance Exchange Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, B. & O., Lima, Ohio.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, 702 E. 51st St., Chicago. Next annual meeting, May 24-27, 1920, Hotel Sherman, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabash Ave., Winona, Minn. Next convention, September 7-10, Hotel Sherman, Chicago.

MAINTENANCE OF WAY MASTER PAINTERS' ASSOCIATION.—E. E. Martin, Union Pacific R. R., Room No. 19, Union Pacific Bldg., Kansas City, Mo. Next convention, October 5-7, 1920, Detroit, Mich.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York. Next annual meeting, May 25-28, Curtis Hotel, Minneapolis, Minn.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass.

MASTER CAR BUILDERS' ASSOCIATION.—(See American Railroad Association, Section III, Mechanical.)

NATIONAL ASSOCIATION OF RAILWAY AND UTILITIES COMMISSIONERS.—James B. Walker, 49 Lafayette St., New York. Next convention, November, 1920, Washington, D. C.

NATIONAL FOREIGN TRADE COUNCIL.—O. K. Davis, 1 Hanover Square, New York. Next convention, May 12-15, 1920, San Francisco.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, Kelly-Derby Co., Peoples Gas Bldg., Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2d Tuesday in month, excepting months of June, July, August and September.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

PACIFIC RAILWAY CLUB.—W. S. Wollner, 64 Pine St., San Francisco, Cal. Regular meeting 2d Thursday in month, alternately in San Francisco and Oakland.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, 1116 Woodward Bldg., Washington, D. C. Next convention, May 12, 1920, Hotel Traymore, Atlantic City, N. J.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 515 Grandview Ave., Pittsburgh, Pa. Regular meetings, 4th Thursday in month, except June, July and August, Americus Club House, Pittsburgh, Pa.

RAILWAY DEVELOPMENT ASSOCIATION.—D. C. Welty, Missouri Pacific R. R., Little Rock, Ark.

RAILWAY ELECTRIC SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, General Electric Co., Chicago. Annual meeting with Association of Railway Electrical Engineers.

RAILWAY EQUIPMENT MANUFACTURERS' ASSOCIATION.—D. L. Eubank, Galena Signal Oil Company, Richmond, Va.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R. Baltimore, Md.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, C. & O., Richmond, Va.

RAILWAY SIGNAL ASSOCIATION.—(See American Railroad Association, Section II, Signal Division.)

RAILWAY STOREKEEPERS' ASSOCIATION.—(See American Railroad Association, Section VI, Purchases and Stores.)

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Next convention, June 9-16, Atlantic City, N. J.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, Waterbury Battery Co., 30 Church St., New York.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W. Ry., Sterling, Ill.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, West Nyack, Rockland County, New York.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, P. O. Box 1205, Atlanta, Ga. Regular meetings, 3d Thursday in January, March, May, July, September and November, Piedmont Hotel, Atlanta.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, Western Ry. of Ala., Atlanta, Ga.

SUPPLY ASSOCIATION OF AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—C. N. Thulin, Duff Manufacturing Company, 935 Peoples Gas Bldg., Chicago.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., Cleveland, O.

WESTERN ASSOCIATION OF SHORT LINE RAILROADS.—Clarence M. Oddie, Mills Bldg., San Francisco.

WESTERN RAILWAY CLUB.—J. M. Byrne, 916 W. 78th St., Chicago. Regular meetings, 3d Monday in month, except June, July and August.

Traffic News

The Pacific Mail Steamship Company has announced in San Francisco regular passenger steamship service between that city and Havana, Cuba, beginning May 8. The voyage will take about 16 days.

The Montana State Railroad Commission and practically every commercial club in Montana are co-operating in a campaign to secure an extension of the half-rate on livestock to this state for 90 days. This rate expired on March 31.

The consolidated ticket office at Denver, Colo., is still running, the report that it had been given up having been erroneous. All of the roads which were party to it during government control are still parties, and the office will continue for an indefinite time. The Southern Pacific and the Missouri Pacific have established freight and passenger offices in the Denham building, above the ground floor, but no tickets are sold in those offices.

The Ohio State Industrial Traffic League has elected the following officers: Guy L. Cory, president, Springfield; H. D. Rhodehouse, first vice-president, Youngstown; L. G. Macomber, second vice-president, Toledo; J. G. Young, secretary-treasurer, Columbus. Directors, F. H. Baer, Cleveland; O. J. Vesper, Mansfield; F. M. Renshaw, Cincinnati; H. E. Dean, Toledo; J. E. Harris, Columbus; R. M. Robinson, Dayton; A. Z. Baker, Cleveland; E. T. Butler, Warren; W. W. Hall, Akron; E. W. Huberty, Canton.

Charles S. Fee, passenger traffic manager of the Southern Pacific, has announced that low local summer resort rates to mountain and seashore resorts will be made effective commencing April 30. Two classes of tickets will be sold, one at a 20 per cent reduction from the regular round-trip rate, and good for 90 days, with the final limit placed at October 31; and another, intended to meet the requirements of the average vacationist, will be sold on Fridays and Saturdays, with a time limit of 15 days, and will cost one-third less than the regular round-trip rate.

Fairfax Harrison, president of the Southern Railway, tells R. L. Philips, president of the South Atlantic Ports Association, that he and his lines will oppose any cancellation of the export freight rates from the middle west to the south Atlantic ports. The railroads not in Central Freight Association territory have not as yet filed any concurrence in the export tariffs established by the Railroad Administration December 1 and 31. Daniel Willard, president of the Baltimore & Ohio, filed a protest with the Railroad Administration against the establishment of the export rates to the south Atlantic ports, but no further action has been taken by any of the northern trunk lines.

St. Louis (Mo.) business, according to traffic figures of railroads entering that district, shows an astonishing gain over the volume shown at this season last year. According to a report recently submitted to Acting President T. M. Pierce, of the Terminal Railroad Association of St. Louis, for the first 15 days of March, a gain of 38,266 cars over the corresponding period last year has been recorded. The total interchange service rendered during the first half of March by the Terminal Association for lines entering St. Louis, represented a movement of 149,199 cars, or an average of approximately 10,000 cars daily. For the same period last year 110,933 cars were interchanged between connecting roads at St. Louis, or a daily average of less than 7,400. A new record for 1920 was established on March 14, when the Terminal Association received from or delivered to connections a total of 11,356 cars.

Fruit Growers' Express

The Fruit Growers' Express Company, incorporated under the laws of Delaware, has been organized by the principal railroads east of the Mississippi river to acquire and operate, after May 1, the Fruit Growers' Express, heretofore operated by Armour & Company. It is to perform the refrigerator and other protective service for the movement of perishable freight on the railroads

heretofore handled by Armour & Company. H. B. Spencer, who has been director of the Division of Purchases of the Railroad Administration, and was formerly vice-president, in charge of purchases, of the Southern Railway, is president of the company. The other officers include W. G. Brantley, during federal control president and general counsel of the Atlanta, Birmingham & Atlantic, who will be vice-president and counsel; E. J. Roth, during federal control manager of the Stores Section of the Railroad Administration, who will be general manager; D. R. MacLeod, secretary; H. F. Pierce, treasurer, and C. P. Cooper, controller. The headquarters of the company will be at Washington, D. C.

Bureau of Traffic, I. C. C.

The Interstate Commerce Commission on March 30 announced the appointment of W. V. Hardie as its director of traffic, effective at once. Mr. Hardie will have charge of the newly-created Bureau of Traffic, which is to absorb the present Bureau of Tariffs and will devote itself, under the direction of the commission, to matters pertaining to traffic and rates as to which the commission's jurisdiction has been greatly enlarged by the new transportation act. The former Bureau of Tariffs will be the tariff section of the new bureau, and possibly other sections will be organized. The commission also proposes to organize other bureaus to handle matters in connection with its new functions, among which it is expected there will be a bureau of car service and a bureau to deal with financial matters, such as the regulation of security issues.

One of the most important functions of the new bureau is to assist the commission in matters pertaining to the division of the country into rate groups or districts and the making of rates in each district to produce the 5½ or 6 per cent return provided for by the law. While it is expected that the railroads may file or propose tariffs carrying out their own ideas as to changes in rates to produce the required amount of revenue, the commission, by the law, is also given the power to initiate, modify or adjust the rates. Mr. Hardie has been assistant to the director of the Division of Public Service of the Railroad Administration and prior to that time was traffic manager of the Oklahoma Shippers' Association. After the termination of government control he was appointed to an office in the traffic department of the Missouri, Kansas & Texas lines.

Silk Prohibition Illegal

The clause in freight tariffs forbidding the acceptance of silk for transportation by freight was this week brought before the United States Circuit Court of Appeals in New York City and was declared by the Court unlawful. This clause, applying to unmanufactured silk, except when offered in carloads, was put into the tariff by order of Director General Hines, while the railroads were in the hands of the government, and it has since been in effect on substantially all of the railroads of the country. This prohibition was ordered because of heavy losses due to thefts of silk from freight cars.

The suit was brought by Cheney Brothers, silk manufacturers and other silk dealers, asking for an injunction against the director-general. In the district court Judge Mayer decided in favor of the plaintiffs, but this decision is now reversed, the Court of Appeals holding that the act of the director-general in making a permanent prohibition against the carriage of silk was reviewable by the court. The decision of the court of appeals says:

"It is the elemental duty of the common carriers to accept and carry all goods usually carried. Silk is a form of merchandise which has been carried by the companies for many years. The output of the mills in 1919 in this country is said to have exceeded in value $600,000,000, and the plaintiffs, if refused transportation, will suffer irreparable injury.

"The refusal of the defendant, Director General Hines, had no connection with his war powers, but was founded solely on the value of the silk and the danger of loss to the carriers through theft. This would be a reason for fixing a rate of freight proportional to the value of the silk and to the risk of the carriers, but is no better reason for an absolute prohibition than would exist in the case of wheat, coal, or other goods."

The opinion was written by Judge Ward.

Commission and Court News

Interstate Commerce Commission

The Post Office Department has filed with the Interstate Commerce Commission an answer to the reply of the carriers to the petition of the department for a rehearing in the railway mail pay case.

The Interstate Commerce Commission has issued an order approving tariffs put into effect by the Railroad Administration, naming carload minimum weights on mixed stock feeds. Owing to the shortage of cars, the carriers under federal control were authorized by the Railroad Administration to establish these increased minimum weights, subject to tariff provisions making them expire on March 31. The commission recognized the continuance of the emergency, and its order will allow the tariffs to remain in effect.

The Interstate Commerce Commission has announced a hearing at Washington on April 20 regarding the rules and regulations to be prescribed, in accordance with the provisions of the transportation act, that after July 1 no carrier subject to the act shall deliver freight transported by it until all charges have been paid, except under regulations prescribed by the commission. The law says that these provisions must not be construed to prohibit carriers from extending credit to the United States or any department, bureau or agency thereof, or to any state or territory or political subdivision thereof, or the District of Columbia. The commission will hear all who desire to be heard.

State Commissions

The Canadian Railroad Commission has announced that it will not interfere with the ruling of Canadian railways against accepting prepayment charges on freight destined to the United States. This ruling was made because of the unfavorable exchange rate. The commission has decided, however, to continue its hearings on applications made by the boards of trade of a number of Canadian cities. These organizations contend that the railways are without authority to make such a ruling.

The Canadian Freight Association has successfully applied to the Board of Railway Commissioners for Canada, on behalf of the railway companies in Canada subject to the jurisdiction of the board for an order authorizing the railway companies to publish and file charges for the use of heated refrigerator cars on the basis of 1½ cents per mile, with a minimum of $2 in addition to the regular freight charges. The board's order stated that the necessary tariffs may be published and filed not less than seven days previously to the date, or dates, on which they are intended to come into force.

The Pacific Electric has been ordered by the Railroad Commission of California to file monthly reports showing the progress made by the company in its plans for depot construction and main line track changes at San Pedro, Cal. The action was taken in response to a complaint filed by the San Pedro Chamber of Commerce and requires "due diligence in executing the plan." Referring to the depot construction and changes in the trackage, the commission stated that it appears that delays in this work have been due to shortage of men and high prices. Revised estimates show that the cost of the depot to be constructed will be $10,000 greater than was originally authorized.

Personnel of Commissions

Robert Hutcherson, assistant rate expert for the Railroad Commission of California, has resigned to become connected with the Parr Terminal and the Parr-McCormick Steamship Line, with headquarters at San Francisco, Cal. **J. E. Harraman,** heretofore rate expert for the Wells-Fargo Express Company, and the Interstate Commerce Commission, with headquarters at San Francisco, Cal., succeeds Mr. Hutcherson as assistant rate expert for the Railroad Commission.

Foreign Railway News

Chinese Railway Strike

LONDON.

A Reuter cable states that the State Department has been advised of a general strike on the Chinese Eastern Railway, which is in Manchuria, following upon an unsuccssful demand by the social revolutionists that General Horvat, director of the railway, should relinquish his authority over the line.

New Transandine Railway

A government decree has been signed, writes George Mallet to the Weekly Bulletin of the Canadian Department of Trade and Commerce, authorizing the concession of a metre railway between the Yelcho lake and the Argentine frontier. This new line will be 70 kilometers in length, and will connect with another projected line under consideration in the neighboring republic which will extend to Colonia 16 de Octubre, in the Department of Chubut.

The concession will be for fifty years, but the state will have the power to acquire it at any time on payment of its net cost, subject to a rebate of 2½ per cent for depreciation for each year which has passed since its construction.

American Machine Tools in the Dutch East Indies

American machine tools are rapidly gaining an enviable reputation in this market, writes Consul Harry Campbell, Soerabaya, Java. One of the largest and most successful machine shops in Soerabaya is completely equipped with modern American machine tools and is securing an abundance of orders for shop-work which, it appears, it is able to fill more satisfactorily than any of its competitors. It is announced that this concern has recently been awarded the contract for the iron and steel work of a new government railway terminal at Tandjong Priok, the port of Batavia. This speaks well for the Soerabaya shop, with its American equipment, in view of the competition of Batavia firms located so much nearer the work.

Italy to Use Liquid Fuel for Railway Locomotives

LONDON.

An article in the Times Trade Supplement says that in consequence of the scarcity and high cost of coal, the Italian Minister of Railways has ordered the immediate remodeling of 100 locomotives for use with liquid fuel. If the results are satisfactory, a further 200 locomotives will be adapted.

In Verona and Florence trials are being made with oil and coal mixed, and in Naples with oil only. Fourteen locomotives have been remodeled and are in use between Brindisi and Bari. All tests made hitherto have been very satisfactory.

The use of liquid fuel on a large scale is the only means of replacing coal quickly, as the electrification of railways can only be carried out in the course of some years. The Italian experiment must be regarded as an attempt to cope with one of the most important economic problems of the immediate future.

Condition of Belgian Railways

The following is stated to be the condition of the Belgian railways on January 1, writes Trade Commissioner C. E. Herring, Brussels: Freight cars available average about 14,000 daily, while in 1914 the daily average furnished Belgian shippers was in the neighborhood of 20,000. The number of freight trains running is about 84 per cent of the number of trains before the war. The average daily tonnage hauled is 171,000 tons, as compared with a daily average of 190,000 tons in 1914. The passenger trains in daily operation number 1,536.

On January 1, 1919, there were but 578 locomotives in good running condition; this number is now said to be increased to 2,776. Railway receipts have greatly increased in recent months, although there will probably be some deficit for the year because of the heavy monthly deficits during the period following the armistice. For the 11 months ending November 30, 1919, the total receipts amounted to 296,000,000 francs ($57,128,000 at normal exchange), while the total for the year 1913 was 308,000,000 francs ($59,444,000).

During November, 1919, passenger and passengers' baggage receipts amounted to 13,040,000 francs ($2,516,720), while freight receipts came to 21,400,000 francs ($4,130,200). The corresponding figures for November, 1913, were 7,757,000 francs ($1,497,101) and 19,493,000 francs ($3,762,149), respectively. This increase of current receipts is, of course, partly occasioned by an increase in rates since the armistice, and it is reported that a further increase is imminent.

The need for additional rolling stock is acute. Locomotives and cars reclaimed from Germany are usually found to be in need of extensive repairs, and it has been impossible to obtain prompt delivery of new orders. At present it is stated that it would take more than 4,000 additional freight cars daily to meet the demands of commerce and industry.

Belgian Railway Reconstruction

The rapid rate of railway reconstruction in Belgium has really been remarkable, says the Railway Gazette, London. At the beginning of last year the total number of locomotives actually fit for service only amounted to 279. By the end of 1919 this number had been increased to 2,700, a ten-fold growth. The effect of this increase was to make it possible to operate 50 per cent of the pre-war passenger service and 65 per cent of the pre-war number of goods trains. In addition, 675 new locomotives were ordered last year. Altogether, 9,400 passenger cars and 57,800 freight cars of various types were repaired during the year, and 9,000 new freight cars were ordered. Perhaps the most striking fact in the whole of the year's operation was that in December, 1919, it was possible to run some 1,100 freight trains a day, which is 40 times the number operated in January of the same year. Belgium, whose transport system suffered terribly during the war, including the wanton damage inflicted by the Germans on their final evacuation, can certainly claim to have accomplished something notable in its railway reconstruction.

Use of Air Brakes on Swedish Railways

Some few months ago, writes Consul General D. I. Murphy, Stockholm, the Swedish State Railways began to equip their rolling stock with Kunze-Knorr air brakes, a German invention. By the end of this year it is expected that 60 locomotives and 1,000 cars will be equipped with them. A project is before the Riksdag to grant an increased appropriation so that all the rolling stock of the State Railways, consisting of 1,100 locomotives, 2,500 passenger cars, and about 27,000 freight cars, may be provided with this particular brake.

The Swedish newspapers express gratification that the Kunze-Knorr brakes are to be manufactured by Aktiebolaget Nordiska Armaturfabrikerna, at Lund, that company having purchased the manufacturing rights for Sweden, Norway, and Denmark. The private railways in Sweden have been undecided as to the adoption of an air-brake system, but the papers announce that there is no longer any doubt as to its adoption.

British Railway Regulation

LONDON.

At practically all the annual meetings of the English railway companies, held recently, a statement was made that a committee of the council of the Railway Companies' Association has been appointed and is in close touch with the Ministry of Transport, and that it has been agreed that before legislation is introduced as to the future of the railways the government will consult with the association through that committee. The impression apparently prevails that there is no cause for uneasiness as to the relations between the railways and the Ministry of Transport.

Sir Gilbert Claughton, the chairman of the London & North Western, said at the annual meeting of his company that he would deprecate in the strongest possible terms any doubt being cast upon the good faith of the government as to its intention of dealing fairly with the railways. The railways knew the great value which the government placed upon the services which the railways admittedly rendered during the war and he was convinced that the shareholders need not have the slightest doubt that proper regard would be given to their rights.

Equipment and Supplies

Plans for Use of $300,000,000 Loan Fund

Plans for the use of the $300,000,000 revolving fund, placed at the disposition of the Interstate Commerce Commission to make loans to railroads, were discussed at a conference on March 25 by a committee representing the Association of Railway Executives, with Commissioners Clark, Meyer, Daniels and Eastman, Director General Hines and R. B. Leffingwell, assistant secretary of the treasury.

Among the questions discussed was as to whether most of the available sum would be used to greatest advantage if invested in terminal improvements, etc., or in equipment.

It is understood that the executives, represented by T. De Witt Cuyler, Samuel Rea, Howard Elliott, Daniel Willard, Henry Walters and Alfred P. Thom, were inclined to urge the use of the fund largely for equipment, both because of the great need for it and because equipment can be purchased for a 25 per cent initial payment, and the fund would, therefore, accomplish more than if used otherwise.

The purchase of 80,000 freight cars, 20,000 refrigerator cars, 2,000 passenger cars, and 2,000 locomotives was discussed.

The railroads' program of capital expenditures also depends on how soon they can collect from the Railroad Administration for rental due. Director General Hines is expected to ask Congress soon for an appropriation of over $400,000,000, which will enable him to make further payments to the roads.

Locomotives

THE PACIFIC GREAT EASTERN is inquiring for three Mikado type locomotives.

THE ILLINOIS TERMINAL has ordered two Mogul type locomotives from the Baldwin Locomotive Works.

THE PITTSBURG & SHAWMUT has ordered 2 Atlantic type locomotives from the American Locomotive Company.

THE CHICAGO HEIGHTS TERMINAL AND TRANSFER has ordered one 0-6-0 type locomotive from the Baldwin Locomotive Works.

THE NEW YORK, NEW HAVEN & HARTFORD is reported as about to place orders for about 50 Mountain and Mikado type locomotives.

THE CALIFORNIA WESTERN RAILROAD & NAVIGATION COMPANY has ordered one Prairie type locomotive from the Baldwin Locomotive Works.

THE ANN ARBOR is having five Consolidation type locomotives repaired and equipped with superheaters at the plant of the Lima Locomotive Works.

THE NATIONAL RAILWAYS OF MEXICO are inquiring for 16 Pacific and 15 Mikado locomotives. The inquiries have been issued from Mexico City.

THE CENTRAL OF NEW JERSEY is having 25 locomotives repaired by the Baldwin Locomotive Works and 15 by the American Locomotive Company.

THE PENNSYLVANIA RAILROAD is having 53 Mikado type locomotives repaired at the shops of the Baldwin Locomotive Works and may have repairs made to a total of 300 locomotives at the same shops.

THE LOUISIANA & ARKANSAS, reported in the *Railway Age* of February 20 as having ordered two locomotives from the Baldwin Locomotive Works, has ordered two additional 10-wheel locomotives from the same company.

THE ATCHISON, TOPEKA & SANTA FE, reported in the *Railway Age* of February 27 as being in the market for 50 locomotives, has ordered 30 Mikado, 10 Santa Fe and 10 Mountain type locomotives from the Baldwin Locomotive Works.

THE CHILEAN STATE RAILWAYS, through their office at room 1504 City Investing building, 165 Broadway, New York, are inquiring for 30 Mikado and 10 other locomotives of 5 ft. gage, and 20 Mikado and one Mallet locomotives of metre gage.

Freight Cars

THE LIBERTY EXPORT & IMPORT COMPANY is inquiring for 100 cane cars.

THE MAINE CENTRAL is inquiring for 6 30-ft. steel underframe caboose cars.

THE BUFFALO, ROCHESTER & PITTSBURGH is inquiring for 40 caboose cars.

THE CHICAGO, BURLINGTON & QUINCY is inquiring for 500 gondola cars.

THE HERSHEY SUGAR CORPORATION (Cuba) is inquiring for 20 30-ton gondola cars.

THE NORTHERN PACIFIC is inquiring for 100 24-ft. double-sheathed caboose cars.

THE AMERICAN SMELTING & REFINING COMPANY is inquiring for 40 50-ton box cars.

THE NASHVILLE, CHATTANOOGA & ST. LOUIS is inquiring for 1,000 to 2,000 steel underframes.

THE BOSTON & MAINE is in the market for 1,000 40-ton box cars and for 1,000 50-ton box cars.

THE STANDARD STEEL CAR COMPANY is planning to build 100 10,000 gal. capacity tank cars for stock.

THE U. S. SMELTING, REFINING & MINING COMPANY is inquiring for 40 50-ton single-sheathed box cars.

THE CHILEAN STATE RAILWAYS are in the market for 200 coal cars, 160 freight cars, 200 flat cars and 20 refrigerator cars. (See note above under locomotives.)

THE NEW YORK CENTRAL reported in the *Railway Age* of February 27, as being in the market for a large number of freight cars, on Wednesday placed orders for 8,000 box and hopper cars.

THE ERIE RAILROAD is having repairs made to 150 freight cars at the shops of the American Car & Foundry Company, and repairs to 125 freight cars at the shops of the Standard Steel Car Company.

THE BALTIMORE & OHIO is asking for prices on car bodies for 2,500 box cars of 40-ton capacity, 600 hopper cars of 50-ton capacity, 500 refrigerators of 40-ton capacity and 600 flat cars of 50-ton capacity.

THE PRUDENTIAL OIL COMPANY, reported in the *Railway Age* of March 19, as inquiring for 50 40-ton, 8,000 gal. tank cars and 50 50-ton 10,000 gal. capacity tank cars, has ordered this equipment from the American Car & Foundry Company.

Passenger Cars

THE GEORGIA RAILROAD is inquiring for six coaches.

THE LOUISIANA & ARKANSAS is inquiring for 3 steel coaches.

THE BOSTON ELEVATED has ordered 65 subway cars from the Pressed Steel Car Company.

THE PITTSBURG & SHAWMUT is inquiring for 3 steel coaches and 2 combination baggage and smoking cars.

THE CHILEAN STATE RAILWAYS are in the market for 80 passenger coaches. (See note above under locomotives.)

Machinery and Tools

THE LEHIGH VALLEY is asking for prices on a large list of machine tools.

Supply Trade News

The Copper Clad Steel Company, Rankin, Pa., has opened a sales office at room 530, 30 Church street, New York. **R. A. Paterson** is district sales agent.

Stewart H. Ford has recently opened an office at 608 Mutual building, Richmond, Va., and is engaged in the railway supply business, specializing on the Rees car and journal jacks and Hisey-Wolf electric portable tools.

The Oxweld Acetylene Company, Newark, N. J., has taken over the manufacture of the Prest-O-Lite welding and cutting equipment. This apparatus, with certain refinements of design, is now being manufactured by the Oxweld Acetylene Company under the name of Eveready welding and cutting outfits.

Joseph T. Ryerson & Son, Chicago, have made an arrangement with the **Camden Iron Works,** Camden, N. J., to become the selling representatives of that company, which is engaged in manufacturing hydraulic tools, centrifugal pumps, cast iron pipe and fittings, gas holders and kindred products.

Charles C. Phelps has recently become associated with the **Uehling Instrument Company,** 71 Broadway, New York, combustion engineers and manufacturers of CO_2 recording equipment and other fuel economy apparatus. Mr. Phelps is devoting most of his attention to research work in connection with the efficient combustion of fuel oil in boiler furnaces. He graduated from Stevens Institute of Technology with the degree of mechanical engineer and has since been studying power plant problems, having been for five years associated with the Ingersoll-Rand Company, New York. Mr. Phelps is an associate member of the American Society of Mechanical Engineers.

J. S. Lemley, who for the past five years has been general sales manager of the G. F. Cotter Supply Company, Houston, Texas, has left that company to become associated with and a partner of **W. D. Jenkins,** Dallas, Texas, representative of manufacturers of railway equipment and supplies, with principal office at Dallas and offices also at Houston and New Orleans, La. Mr. Lemley will have full charge of all mechanical matters. He served on the Baltimore & Ohio in 1898 as a locomotive engineman and a short time later was promoted to trainmaster. After serving in this capacity for two years he went to the mechanical department of the Chicago, Milwaukee & St. Paul. Two years later he was appointed general supervisor of locomotive operation of the Baltimore & Ohio South-Western and the Cincinnati, Hamilton & Dayton, with headquarters at Cincinnati. After serving in that capacity for two years he went to the mechanical department of the Texas & Pacific, remaining with that road until July 1, 1915, when he became associated with the G. F. Cotter Supply Company. **C. E. Naylor,** who has been associated with Mr. Jenkins since 1916, and formerly served on the Texas & Pacific and the International & Great Northern in the mechanical and traffic departments, is in charge of the Houston office. **R. L. Irwin** is in charge of the New Orleans territory. Mr. Irwin was formerly purchasing agent of the Texas & Pacific, and during federal control of the railroads was purchasing agent of the lines under the jurisdiction of F. G. Pettibone as federal manager at Dallas, Texas. **J. K. Bagley,** formerly with the Texas & Pacific as chief clerk in the purchasing department, is in charge of the New Orleans office.

Locomotive Stoker Company

A. C. Deverell has resigned as superintendent of motive power of the Great Northern, at St. Paul, Minn., to become western sales manager of the **Locomotive Stoker Company,** Pittsburgh, Pa., with office at Chicago. He was born in Montreal, Que., and after attending the public schools of that city began his career in the shops of the Grand Trunk at Montreal. He went west in 1895, and while performing some special work for Samuel Hill, president of the Eastern Minnesota Railway, came to the notice of the late James J. Hill, who appointed him superintendent of the freight car shops at St. Cloud, Minn. He was promoted to superintendent of the St. Paul locomotive and passenger car shops, the largest shops on the Great Northern system, employing approximately 19,000 men. He subsequently became assistant superintendent of motive power and later served as superintendent of motive power until his recent appointment as western sales manager of the Locomotive Stoker Company.

A. C. Deverell

H. C. Woodbridge

J. J. Byrne

H. C. Woodbridge has resigned as supervisor of the Fuel Conservation Section of the U. S. Railroad Administration to enter the service of the Locomotive Stoker Company as representative, with headquarters at Pittsburgh, Pa. He was born on October 7, 1874. He worked in the machine shops at Chatham, N. Y., and was extra fireman on the Lebanon Springs Railroad during 1891 and 1892. In 1897, he graduated as mechanical engineer from Cornell University. From June, 1897, to March, 1899, he worked as a machinist in the Minneapolis & St. Louis shops at Minneapolis, Minn. He was foreman at Albert Lea, in charge of locomotive and car work from March, 1899, to February 1903, but during the last two years of this period served as traveling fireman and extra locomotive engineman and pilot. In February, 1903, he was made traveling engineer and inspector for the American Locomotive Company, resigning in September, 1904, to take service as general foreman on the Delaware, Lackawanna & Western, at Elmira, N. Y., serving until November, 1905. He was appointed a master mechanic on the Buffalo, Rochester

& Pittsburgh, in November, 1905, remaining in that position until January, 1908. From January, 1908, to August, 1909, he was occupied in special work for the superintendent of motive power, and was made special representative and assistant to general manager in August, 1909, remaining in that work until June, 1918. He was then appointed supervisor, Fuel Conservation Section, U. S. Railroad Administration, Allegheny Region, which position he now leaves to take service with the Locomotive Stoker Company.

J. J. Byrne has been appointed district representative of the Locomotive Stoker Company, with his headquarters at new offices opened in Washington, D. C. He was born in Cincinnati, Ohio, and attended the public schools of that city and Delaware, Ohio. He entered railroad service in 1903, in the Cleveland, Cincinnati, Chicago & St. Louis shops at Delaware, as machinist apprentice. After completing his apprenticeship, he entered the service of the New York Central Lines as machinist in the Collinwood shops. He remained in the employ of the New York Central until 1909, when he left to accept a position as mechanical expert, with the Locomotive Stoker Company. In 1917 he was appointed representative with headquarters in New York, and the following year was transferred to the southern territory, with headquarters at Roanoke, Va. Later in the year he was located in Richmond, Va., in charge of the Locomotive Stoker Company's office at that place.

Chicago Pneumatic Tool Co. Moves to New York

The general offices of the **Chicago Pneumatic Tool Company** on March 31, were removed from Chicago to the Chicago Pneumatic building, a new ten-story structure erected for the exclusive use of the company of 6 East Forty-fourth street, New York. The move was accomplished without appreciable interruption to business over the week-end. Arrangements, carefully made in advance, made possible the jump of the organization across half of the continent without interference to the normal routine of business except for a brief period. The Chicago district sales branch, previously in the Fisher building, has been moved to new quarters at 300 North Michigan Boulevard. The Chicago service branch, formerly at 521 South Dearborn street, has been consolidated with the sales branch, at the new address, occupying the first floor of the building, while the sales offices will be on the second floor or Boulevard level. Both departments of the Chicago branch are under the direction of **J. L. Canby**, district manager.

J. H. Williams & Co. Expands Activities

Special meetings of the stockholders of **J. H. Williams & Co.**, Brooklyn, N. Y., and of the **Whitman & Barnes Manufacturing Company**, Akron, Ohio, have been called for April 2 to ratify an agreement entered into by their respective presidents, made subject to the approval of the stockholders, for the merging of the Chicago and St. Catherines, Ont., plants of the Whitman & Barnes Manufacturing Company with J. H. Williams & Co. This plan contemplates the operation by J. H. Williams & Co. of drop forging and drop forged tool plants at Brooklyn, N. Y., Buffalo, N. Y., and West Pullman, Chicago, Ill., in the United States, and at St. Catherines, Ont. in Canada, which is located close to Buffalo, and the business will be operated by the individuals now connected with these plants. The plans of J. H. Williams & Co., under this arrangement, call for a considerably extended business. The Whitman & Barnes Manufacturing Company's Chicago plant includes the new forge shop 100 ft. by 500 ft., and power house built recently by Stone & Webster at a cost, including complete equipment, of $1,250,000. The Whitman & Barnes Manufacturing Company will continue its business of making twist drills, reamers and collateral lines on an extended scale at Akron, Ohio.

Obituary

John N. Derby, vice-president of **Manning, Maxwell & Moore, Inc.**, New York, died at his home in Greenwich, Conn., on March 29.

Fred W. Snow, president and general manager of the **Ramapo Iron Works**, Hilburn, N. Y., died at his home in Hilburn on March 26. He was born at Woonsocket, R. I., on September 12, 1853, and was educated in the public schools of Jersey City, also at a private school in Newburgh, the Peekskill Military Academy and the Rensselaer Polytechnic Institute, Troy, N. Y. At the completion of his second year in the institute, in July, 1872, he entered the Rhode Island Locomotive Works at Providence, to learn the practical part of iron manufacturing. In 1875, he was appointed assistant superintendent of the Ramapo Wheel & Foundry Company and in 1881, when the Ramapo Iron Works was organized, he accepted the position of superintendent of this company, resigning his former position. In May, 1900, he was elected president and general manager of the company and held that position until his death. He also was president of the Rockland Electric Company and the Mountain Spring Water Company. Mr. Snow invented a number of important inventions for railroad equipment, including automatic switch stands which are in extensive use on railroads throughout the United States. He was a director of the American Brake Shoe & Foundry Company and other corporations. In 1906 he organized the Canadian Ramapo Iron Works, Ltd., of which he was treasurer.

F. W. Snow

Trade Publications

TRACK MAINTENANCE.—Templeton, Kenly & Co., Ltd., Chicago, have recently issued a large size four-page illustrated folder which describes the application of the Simplex track jack manufactured by this company in modern maintenance work. The illustrations show the general dimensions of the jack and its method of use with a standard lining bar.

CRANES.—The Whiting Foundry Equipment Company, Harvey, Ill., has issued a new edition of its crane catalogue, designated as catalogue No. 151, containing 80 pages, 6 in. by 9 in., with a great many illustrations. Cranes of all types are represented and detailed information is given concerning them.

AIR COMPRESSORS.—Bulletin 75-U of the Sullivan Machinery Company, Chicago, describes in considerable detail the Sullivan tandem compound Corliss steam driven air compressors, class "WC," which are available in unit capacities of from 1,000 to 3,150 cu. ft. of free air a minute. Photographs accompanying the text show installations of the Sullivan-Corliss compressors and indicate the range of service which they are performing.

TRAIN OPERATION BY SIGNAL INDICATION is the title of Bulletin No. 2 recently issued by the four signal companies, the Union, the General, the Federal and the Hall, and made up of reprints of articles which have appeared in the *Railway Age*. The first one is that which was published December 27, 1918, with comments by H. M. Sperry, publicity agent for the four companies. The cost of stopping trains is discussed by C. C. Anthony and others. This compilation has been made to show that the use of automatic block signals is justified, not only for the purpose of saving life and limb and preventing damage to property but by the economic results in every-day operation. Figures are given showing a saving on 100 miles of road of $86,000 a year. The pamphlet consists of 12 pages, 8½ in. by 11 in., and may be had from Mr. Sperry, 347 Madison avenue, New York.

Financial and Construction

Railway Financial News

CHICAGO & NORTH WESTERN.—At the annual meeting on April 13, the stockholders will be asked to authorize the creation of a blanket refunding and improvement mortgage so drawn that the amount of bonds issued thereunder, together with the outstanding prior debt, shall not exceed three times the outstanding capital stock. The mortgage is to mature May 1, 2037.

At the same meeting the stockholders will be asked to approve the purchase of the property of preprietary companies, all of the capital stock of which is owned by the Chicago & North Western.

MACON, DUBLIN & SAVANNAH.—J. A. Streyer, of Macon, Ga., and W. L. Seddon, of Norfolk, Va., have been elected directors to succeed E. T. Brown, of Atlanta, Ga., and M. J. Caples, of Richmond, Va.

MARSHALL & EAST TEXAS.—An order has been entered by Federal Judge Estes, of Austin, Tex., instructing Bryan Snyder, receiver of the Marshall & East Texas, to sell certain sections of the road. The Marshall & East Texas, operation of which was discontinued during federal control, extends from Winnsboro, Tex., to Marshall, a distance of 92 miles. The statutes of Texas forbid tearing up the main-line track of a railroad once laid, and the attorney general's department has not given assent to any portion of the road being taken up, despite the fact that it has not been in operation for two years. Those portions which are offered for sale are: Gilmer to James, 14 miles; James to Harleton, 12 miles; Harleton to Marshall, about 16 miles; Marshall to Elysian Fields, 17 miles. The Marshall terminals are to be sold separately.

WABASH, CHESTER & WESTERN.—The Wabash, Chester & Western, running from Menard, Ill., to Mt. Vernon, a distance of approximately 64 miles, was purchased on March 27 by Jesse Dimond, a Chicago coal operator, for $400,000.

Railway Construction

DE QUEEN & EASTERN.—The De Queen & Eastern and the Texas, Oklahoma & Eastern are extending their lines between De Queen, Ark., and Broken Bow, Okla., to form a connection midway between the two cities. It is expected that the construction will be completed the latter part of this year.

ERIE RAILROAD.—A contract has been given to the Arthur McMullen Company, New York, for removing the present bridge over the Passaic river, Newark, N. J., and building the substructure for a new bridge. The plans call for a double-track bascule bridge, Strauss type.

KANSAS CITY, MEXICO & ORIENT.—At a recent meeting of the directors of the Kansas City, Mexico & Orient, held at San Angelo, the matter of resuming the construction at an early date of the long proposed branch line that is to run from that city to Del Rio, a distance of 170 miles, was informally discussed. It is planned to carry this project to fulfillment as soon as the necessary financial arrangements for doing so can be made. Part of the grade for this branch was constructed a few years ago. With its completion and the construction of an international railroad bridge across the Rio Grande river, connecting Del Rio with Las Vacas, Mexico, a new international gateway will have been established. The National Railways of Mexico have had a branch line under construction for some time. This line is to run from Allende, on its Eagle Pass Torreon division, to Las Vacas, about 75 miles, passing through a region that is under irrigation and in a high state of cultivation.

PITTSBURG & SHAWMUT.—Contracts are to be let in the near future for the construction of a 40 ft. by 160 ft. storehouse with offices for the mechanical department at Brookville, Pa., and for lining the Mauck tunnel on the same line, 2,000 ft., with concrete.

Railway Officers

Executive

Harlan J. German has been elected vice-president in charge of operation of the Montour, with headquarters at Pittsburgh, Pa., succeeding **F. C. Baird,** resigned, effective April 1.

Archibald Fries, who has been elected vice-president in charge of traffic and commercial development of the Baltimore & Ohio, with headquarters at Baltimore, Md., as noted in the *Railway Age* of March 5 (page 737), was throughout most of federal control traffic manager. Mr. Fries was born in Cincinnati, Ohio, on February 27, 1864. He was educated in the Cincinnati public schools and completed a special college course. He entered the service of the Ohio & Mississippi, now the Mississippi division of the Baltimore & Ohio, in October, 1882, as entry clerk in the local transfer freight office at Storrs Station, Ohio. Having served in various clerical capacities up to that of chief clerk until 1890, he was then given the position of chief rate and claim clerk in the office of the general manager of the Continental Line, operating a fast freight line over the Ohio & Mississippi and the Baltimore & Ohio. Later he became accountant, chief clerk and acting manager. He was afterwards transferred as chief clerk to the general freight office. While there he was appointed general agent and assistant general freight agent. On January 1, 1913, he was promoted to general freight agent of the Baltimore & Ohio, with headquarters at Pittsburgh, Pa., and on October 21, 1916, was appointed freight traffic manager of the eastern lines, with headquarters at Baltimore, Ohio. On January 1, 1918, his jurisdiction was extended over the entire traffic department of the Baltimore & Ohio system. Shortly afterwards he was appointed traffic manager of the eastern lines, the Western Maryland, the Coal & Coke and other roads in the Allegheny region, under the jurisdiction of C. W. Galloway, as federal manager. He retained that position until January 1, 1920, when he was appointed general traffic manager for the corporation.

A. Fries

B. L. Bugg, formerly general manager of the Atlanta, Birmingham & Atlantic, who has been elected president of that road, as noted in the *Railway Age* of February 20 (page 595), was born on August 8, 1869 near Palo Alto, Miss. He received a grammar and high school education and began railroad work in 1887 with the Florida Railway & Navigation Company, now part of the Seaboard Air Line. From 1889 until 1891 he served as operator and agent of the Florida Central & Peninsular, now also part of the Seaboard Air Line. In 1891, he became agent of Georgia Southern & Florida and remained in that position until 1894. He went to the Central of Georgia as agent at Savannah, Ga., in 1895. Resigning from that position in 1907, he became general agent of the Old Dominion Steamship Company. In 1910 he was appointed traffic manager of the Norfolk Southern but resigned in 1912 to accept the same position with the Atlanta, Birmingham & Atlantic. In October, 1912, he was promoted to assistant general manager and later to general manager. Shortly after the United States entered the war he

was given a commission as lieutenant colonel in charge of the organiation of the Sixty-sixth engineers. He was ordered to France in June, 1918, and there his regiment was assigned to operate the Twentieth Grand Division, Transporation Corps on the line of the Paris, Lyons & Mediterranean Railway. Colonel Bugg returned to the United States in June, 1919, and shortly after resumed his duties as general manager of the Atlanta, Birmingham & Atlantic.

Charles W. Galloway, who has been elected vice-president in charge of operation and maintenance of the Baltimore & Ohio, with headquarters at Baltimore, Md., as noted in the *Railway Age* of March 5 (page 737), served as federal manager of the same company during federal control. Mr. Galloway was born in Baltimore, Md., on December 11, 1868, and educated in the public schools of that city. His entire railroad service has been with the Baltimore & Ohio, whose employ he entered on April 1, 1883, as messenger in the telegraph department at Baltimore. From then until April 1, 1891, he served consecutively as clerk and messenger in the transportation office, stenographer to the superintendent of car service and stenographer to the general superintendent and superintendent of transportation. He was appointed trainmaster at Baltimore in 1897 and promoted to assistant superintendent, with the same headquarters, in 1918. On July 1, 1899, he was appointed superintendent of the Cumberland division at Cumberland, Md., but returned to Baltimore in 1901 as superintendent of the Baltimore division. He became superintendent of transportation in 1906 and general superintendent of transportation on July 1, 1910. The following September he was transferred to Cincinnati as general superintendent of the Baltimore & Ohio Southwestern. He was appointed general manager of the Baltimore & Ohio, with headquarters at Baltimore, in April, 1912; transferred again to Cincinnati on July 1, 1916, as general manager of the western lines and on the same date elected vice-president of the Baltimore & Ohio Southwestern. He became federal manager of the Baltimore & Ohio, Western Lines, the Dayton & Union and the Dayton Union on June 1, 1918, and of the Baltimore & Ohio Eastern Lines, the Coal & Coke, the Western Maryland and other roads, on February 1, 1919, and of the entire Baltimore & Ohio system on February 15, 1920.

C. W. Galloway

Financial, Legal and Accounting

Leslie L. Sheppard, assistant auditor and traffic manager of the Raritan River with headquarters at South Amboy, N. J., has been appointed auditor and traffic, effective March 8, succeeding George C. Chittick, deceased.

George H. Hess, Jr., whose appointment as controller of the Great Northern, with headquarters at St. Paul, Minn., was announced in the *Railway Age* of March 5 (page 742), was born at Dubuque, Iowa, on July 14, 1873. He entered railway service in 1892 in the bookkeeping department of the Pacific Express Company at Omaha, Neb. On June 1, 1911, he was appointed examiner in the Bureau of Carriers' Accounts of the Interstate Commerce Commission, which position he retained until January, 1914, when he was appointed accountant in the Bureau of Valuation, Western district of the Interstate Commerce Commission. From April, 1916, to February 29, 1920, he was assistant controller of the Great Northern and on the latter date was promoted to controller. He succeeds J. R. Martin, whose election to vice-president of the Great Northern was announced in the *Railway Age* of March 5 (page 742).

James C. Wallace, who has been appointed auditor of the Cleveland, Cincinnati, Chicago & St. Louis with headquarters at Cincinnati, Ohio, as noted in the *Railway Age* of March 19 (page 994), was up to March 1 assistant auditor of the same company. Mr. Wallace was born at Battle Creek, Mich., on May 22, 1874 and was educated in the public schools of Detroit. He began railroad work in the auditor's office of the Michigan Central at Detroit, Mich., in January, 1903, and remained there until 1906 when he went to New York as accountant in the office of the auditor of the Delaware, Lackawanna & Western. From 1909 until 1911 he was examiner of accounts in the carriers' account division of the Interstate Commerce Commission. He was appointed auditor of disbursements of the Cleveland, Cincinnati, Chicago & St. Louis with headquarters at Cincinnati in December, 1911, becoming assistant auditor in 1912.

Operating

T. W. Evans, assistant general manager of the New York Central, has had his headquarters transferred from New York City to Syracuse, N. Y., effective April 1.

J. W. Tipton has been appointed assistant superintendent and car accountant of the Gulf, Texas & Western, with headquarters at Jermyn, Tex., effective March 1.

W. H. Gemmell, general superintendent of the Minnesota & International during federal control, has been appointed general manager, with headquarters at Brainerd, Minn.

W. K. Lynn, master mechanic of the Gulf & Ship Island at Gulfport, Miss., has been appointed superintendent, with headquarters at Hattiesburg, Miss., succeeding **M. D. Fohey.**

Charles F. Craig, whose appointment as assistant to the general manager of the Western Pacific, with headquarters at San Francisco, Cal., was announced in the *Railway Age* of March 12 (page 807), was born at Burlington, Ia., on March 3, 1884. He entered railway service in May, 1902, in the office of the general manager of the Missouri Lines of the Chicago, Burlington & Quincy, remaining in the operating department of that road until June, 1905, when he entered the service of the Northern Pacific in the office of the assistant to the vice-president at Tacoma, Wash. Later he was promoted to secretary to the vice-president and general manager of that road. In December, 1909, he was employed in a similar position on the Western Pacific at San Francisco. He served as chief clerk to the vice-president and general manager from October, 1902, until the receivers for the property were appointed (in March, 1915), at which time he was appointed secretary to the receiver. Upon the reorganization of the property, in June, 1916, he became secretary of the Western Pacific, and during the period of federal control served as secretary and assistant treasurer. This position he held until his present appointment as assistant to the general manager.

Chas. F. Craig

Traffic

M. O'Connor has been appointed southwestern freight agent of the Seaboard Air Line, with headquarters at New Orleans, La., effective March 16.

Charles F. Case has been appointed commercial agent of the Erie, with headquarters at New York.

N. J. Van Schoyck, assistant superintendent of transportation of the Chicago, Milwaukee & St. Paul, with office at Chicago, has been appointed supervisor of mail and express traffic, with the same headquarters, effective March 18.

Edgar D. Hilleary, assistant general freight agent of the Philadelphia & Reading, who has been appointed general freight agent, with headquarters at Philadelphia, Pa., as noted in the *Railway Age* of March 5 (page 746), was born on September 1, 1877, in Frederick County, Md. He graduated from St. John's College, Annapolis, Md., in 1897. On July 1 of the same year he began railroad work in the office of the foreign freight agent of the Philadelphia & Reading. In October, 1897, he was transferred to the office of the assistant general freight agent in charge of export and import traffic. He served in various other capacities in the same office until he was finally appointed chief clerk. In June, 1905, he became agent of the Central States Despatch Fast Freight Line at Philadelphia, Pa., and in January, 1906, was appointed division freight agent of the New York Division of the Philadelphia & Reading and the Atlantic City. He was transferred to Harrisburg, Pa., on February, 14, 1910, and was promoted to assistant general freight agent in December, 1918.

E. A. Hilleary

Frank J. Woulfe, who has been appointed assistant traffic manager of the Lehigh Valley, with headquarters in New York, as noted in the *Railway Age* of March 5 (page 743), served as general freight agent of the same road from August 1, 1909, until the termination of federal control. Mr. Woulfe was born on November 9, 1863, at Fort Wayne, Ind. He received a public school education and began railroad work on April 1, 1879, as night bill clerk for the Wabash. From then until 1890 he served as cashier and in various clerical capacities. In 1890 he was appointed traveling freight agent of the Lehigh & Wabash Despatch and the Lehigh Valley Transportation Company, with headquarters at Decatur, Ill. In 1898 he went to the Lehigh Valley as general agent at St. Louis, Mo., and was transferred to New York as city freight agent in 1901. Afterwards he was appointed general eastern freight agent and on August 1, 1909, became general freight agent of the system with headquarters at New York, as mentioned above.

F. J. Woulfe

C. J. McDonald, assistant to the regional director of the Central Western region during federal control, has been appointed general agent refrigerator service of the Southern Pacific, with headquarters at San Francisco, effective March 1.

W. P. Buffington, member of the Central Territory Coal & Coke committee of the Railroad Administration, with headquarters at Pittsburgh, Pa., during federal control, has been appointed traffic manager of the Montour, effective April 1.

D. P. Grier has been appointed commercial agent of the Seaboard Air Line, with headquarters at St. Louis, Mo., and **E. D. Lappin** has been appointed commercial agent at Kansas City, Mo., effective March 1.

B. F. Seggerson, traffic manager of the New Mexico Central, with headquarters at Santa Fe, N. M., has been appointed assistant general freight and passenger agent of the Gulf, Texas & Western, with headquarters at Jermyn, Tex., effective March 1.

W. J. Curtis, general agent of the Atchison, Topeka & Santa Fe, with headquarters at Salt Lake City, prior to federal control, has been appointed general agent of the freight and passenger departments of the same road, with headquarters at Atlanta, Ga.

Edwin L. Lewis, formerly assistant general passenger agent of the Philadelphia & Reading, who has been appointed general passenger agent of the same road, as noted in the *Railway Age* of March 5 (page 746), was born September 17, 1882, and educated in Chaffee's Phonetic Institute of Oswego, N. Y., graduating December 22, 1899. He began railroad work as stenographer to the general superintendent of the Central of New Jersey, with headquarters at Jersey City, N. J. On March 12, 1903, he accepted the same position in the office of the general passenger agent of the Philadelphia & Reading. He was promoted to assistant chief clerk in June, 1906, and on December 1, 1909, became district passenger agent at Philadelphia. He was appointed assistant general passenger agent on April 11, 1917, and held that position until July 1, 1918, when he resigned to become assistant sales manager of the Packard Motor Car Company. Later he became sales manager, then general distribution manager and afterwards assistant general manager. He resigned from the latter position on March 1 to accept his recent appointment with the Philadelphia & Reading.

E. L. Lewis

William T. Vandenburgh has been appointed commercial agent of the Seaboard Air Line, with headquarters at Louisville, Ky.; **W. H. H. Terrell** has been appointed commercial agent, with headquarters at Chicago, and **Charles E. Boisseau, Jr.,** commercial agent at Cincinnati, Ohio, effective March 1.

Charles W. Walker has been appointed assistant general freight agent of the Carolina, Clinchfield & Ohio; **C. A. Smith** has been appointed general freight and passenger agent, and **E. P. McEwan,** formerly general agent at Atlanta, Ga., has been appointed general western agent, with headquarters at Cincinnati, Ohio. **H. O. Yant** has been appointed commercial agent, with headquarters at Detroit, Mich.

Joseph J. Byrne, whose appointment as assistant freight traffic manager of the Delaware, Lackawanna & Western, with headquarters at New York, was noted in the *Railway Age* of March 5, (page 741), was, prior to March 1, general freight agent, with the same headquarters. Mr. Byrne was born in Riley, Ohio. He was educated in the public schools

of Indianapolis, Ind., and began railroad work in that city as telegraph operator for the Cleveland, Cincinnati, Chicago & St. Louis. In 1892 he became contracting freight agent of the Nickel Plate Line at Indianapolis, and retained that position until September, 1897, when he was appointed agent of the Lackawanna Line at the same place. In 1901 he was transferred as commercial agent to Cleveland, Ohio, where he remained until November, 1905, when he entered the employ of the Delaware, Lackawanna & Western as division freight agent at Syracuse, N. Y. In November, 1909, he was appointed general eastern freight agent of the same road, with headquarters at New York, and was promoted to assistant general freight agent in 1918. He became general freight agent in February, 1919.

Edson J. Weeks, who has been appointed passenger traffic manager of the Philadelphia & Reading, as noted in the *Railway Age* of March 5 (page 746), served during federal control as general passenger agent of the same road, with headquarters at Philadelphia. Mr. Weeks was born in Schodack, Rensselaer County, N. Y., on January 22, 1857. He graduated from the East Greenbush Collegiate Institute in 1874 and began railroad work in 1875, as a telegraph operator for the Erie at Buffalo, N. Y. Afterwards he became ticket clerk and city ticket agent at the same place. From October 15, 1883, to December 31, 1883, he was city ticket agent for the Chicago & St. Louis, now part of the Atchison, Topeka & Santa Fe, at New York. He was appointed general agent of the passenger department of the West Shore in January, 1884, and retained that position until March, 1886, when he became general agent of the New York Central & Hudson River and the West Shore, with headquarters at Buffalo. He was appointed general passenger agent of the Philadelphia & Reading in 1897, and retained that position until his recent appointment on March 1.

E. J. Weeks

George W. Kridler, whose appointment as general freight agent on the Baltimore & Ohio, with headquarters at Chicago, was announced in the *Railway Age* of March 5 (page 738), entered railway service in the local freight office of the Pennsylvania at Hudson, Ohio, at the age of 18 years. He continued in the employ of this road in the freight offices at Steubenville, Ohio, and Wellsville, for three years, when he was employed by the Empire Fast Freight Line, at Cleveland, Ohio. He remained with the Empire line for seven years, then becoming connected with the New York Central Fast Freight Lines at Cleveland. Later he was employed by the Lake Shore & Michigan Southern as a contracting agent at Cleveland. He was later successively promoted to commercial freight agent, at Cleveland, to general agent at Pittsburgh, Pa., to division freight agent at Youngstown, Ohio, and to assistant general freight agent at Cleveland. He was appointed assistant general freight agent of the New York Central Lines West at Cleveland, a short time prior to July 1, 1918, on which date he became connected with the Division of Traffic of the United States Railroad Administration at Washington. This position he retained until his recent appointment as general freight agent of the Baltimore & Ohio.

Engineering, Maintenance of Way and Signalling

R. P. Forsberg, special engineer of the Pittsburgh & Lake Erie, has been appointed principal assistant engineer of the same road, with headquarters at Pittsburgh, Pa.

H. M. Bassett, corporate engineer of roadway and structures of the New York Central Lines, with headquarters at New York, has been appointed general office engineer, the former corporate title of engineer of roadway and structures having been abolished.

Charles H. Koyl, whose appointment as engineer of water service of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, was announced in the *Railway Age* of January 16 (page 280), was born at Amherstburg, Ont., on August 14, 1855. He graduated from Victoria College, Cobourg, Ont., in 1877, and attended Johns Hopkins University as a fellow in physics from 1881 to 1883. He entered railway service with the Great Northern in 1904 as engineer of water service, which position he retained until December 31, 1919, when he was appointed engineer of water service on the Chicago, Milwaukee & St. Paul. During this period he has had charge of the development of a comprehensive program of water treatment on the Great Northern, particularly on the lines in North Dakota and Montana.

Chas. H. Koyl

John R. Sexton, division engineer of the Marion and Chicago divisions of the Erie, with headquarters at Huntington, Inc., whose promotion to regional engineer in charge of the Chicago region, with headquarters at Chicago, was noted in the *Railway Age* of February 27 (page 662), was born on January 18, 1889, at Long Branch, N. J. He graduated from Rutgers College in 1911, but had been previously employed as a rodman on the Lehigh Valley in the summer of 1909. From August 1, 1911, to October 13, 1913, he was employed consecutively on the New York Central as chainman, rodman, instrumentman and inspector. He then entered the service of the Erie as resident engineer, later becoming assistant division engineer of the Mahoning division. In April, 1916, he was promoted to division engineer of the Meadville division, and in May, 1917, was transferred to the Marion and Chicago divisions, where he remained until his recent promotion to regional engineer.

J. R. Sexton

Mechanical

F. P. Barnes has been appointed master mechanic of the Colorado, Wyoming & Eastern, succeeding **A. D. Howard,** resigned, effective March 8.

Charles Hyland has been appointed mechanical superintendent of the Toledo Terminal, with headquarters at the Boulevard shops of the Toledo Terminal at Toledo, Ohio, effective March 15.

Fred L. Voerge has been appointed assistant master mechanic of the Montana division of the Northern Pacific Railway, with headquarters at Livingston, Mont., effective March 15.

J. L. Butler, master mechanic of the Missouri Pacific at DeSoto, Mo., has been transferred to the position of master mechanic of the St. Louis (Mo.) terminals of the Missouri Pacific.

W. C. Ross, master car builder of the Copper Range, has been appointed master mechanic at Houghton, Mich., succeeding **N. M. Barker,** resigned to engage in other business, effective March 26.

G. W. Cundiff has been appointed road foreman of engines of the St. Louis division of the Mobile & Ohio at Mobile, Ala., and **A. J. Meriwether** has been appointed road foreman of engines of the Mobile division of the Mobile & Ohio and of the Southern Railway in Mississippi, at Meridian, Miss., effective **March 1.**

J. E. Ennis, corporate assistant engineer of rolling stock of the New York Central Lines, with headquarters at New York, has been appointed engineer of equipment claims, the former corporate title of engineer of rolling stock having been abolished.

G. H. Langton, shop superintendent of the Virginian at Princeton, Va., has been appointed master mechanic, with the same headquarters, and the title of shop superintendent has been abolished. **B. E. Nevins** has been appointed master mechanic at Victoria; **H. L. Getty** has been appointed master mechanic at Roanoke, Va., all these appointments are effective March 12.

L. P. Michael, whose appointment as mechanical engineer of the Chicago & North Western, with headquarters at Chicago, was announced in the *Railway Age* of March 26 (page 1076), graduated from Purdue University as a bachelor of science in mechanical engineering, specializing in railroad work, in 1896. He was first employed for about one year as a locomotive fireman by the Wabash and Monon Railways and later worked as a special machinist helper in the shops of the Monon at Lafayette, Ind. He was then for eight years in the service of the Cleveland, Cincinnati, Chicago & St. Louis and during that time held the positions of machinist, air brake foreman, erecting foreman, enginehouse and general foreman, draftsman and inspector of shops and machinery. Since 1906, he has been with the Chicago & North Western, being employed as a draftsman until 1908, when he was promoted to the position of chief draftsman of the motive power and car departments, which position he held until he was recently appointed mechanical engineer.

L. P. Michael

A. J. Devlin, master mechanic of the Western division of the St. Louis-San Francisco at Enid, Okla., has been appointed shop superintendent of the North shops at Springfield, Mo., succeeding **J. E. Henshaw,** transferred; **W. J. Foley,** assistant master mechanic of the Northern division at Monett, Mo., has been appointed master mechanic, succeeding Mr. Devlin, and **F. G. Fisher** has been appointed assistant master mechanic to succeed Mr. Foley, all effective March 16.

General

ATCHISON, TOPEKA & SANTA FE.

The following is part of the personnel of the newly organized traffic department of the Atchison, Topeka & Santa Fe, effective March 1:

F. B. Houghton..	Freight traffic manager....	Chicago.
F. H. Manter....	Asst. freight traffic mgr....	"
J. R. Koontz.....	" " " "	Topeka, Kan.
D. L. Meyers....	" " " "	Chicago.
R. G. Merrick....	General freight agent.....	Topeka, Kan.
H. P. Anewalt...	" " "	Los Angeles, Cal.
J. H. McCabe....	Asst. gen. freight agent....	Chicago.
J. B. Coffey.....	" " " "	"
J. J. Grogan.....	Foreign freight agent.....	"

BALTIMORE & OHIO

The following gives those portions of the new organization of the Baltimore & Ohio not included in the lists of names given in the *Railway Age* of March 5, page 737, and March 12, page 801:

LEGAL DEPARTMENT

R. Marsden Smith.	General attorney.....	Baltimore, Md.
A. H. Boyd, Jr...	General attorney.....	"
Duncan K. Brent.	General attorney.....	"
Chas. R. Webber.	Asst. gen. attorney.....	"
Allen S. Bowie..	Asst. gen. attorney.....	"
F. R. Cross.....	Asst. gen. attorney.....	"
Geo. D. Penniman.	Counsel for Relief Dep't...	"
Morison R. Waite.	Gen. solicitor, west. lines...	Cincinnati, Ohio.
W. A. Eggers....	Asst. gen. sol., west. lines.	"
Wm. G. Conley...	Gen. atty. for W. Va.....	Charleston, W. Va.
C. W. Egan.....	General claim agent.....	Baltimore, Md.
E. L. Williams....	General claim agent.....	Cincinnati, Ohio.

ACCOUNTING DEPARTMENT

W. D. Owens.....	Assistant comptroller.....	Baltimore, Md.
F. A. Deverell....	Assistant comptroller.....	"
J. P. O'Malley....	Assistant comptroller.....	"
O. J. Rider.....	General accountant.....	"
G. H. Pryor.....	Auditor of disbursements..	"
S. W. Hill.....	Ast. aud. of disbursements.	"
W. E. Rittenhouse.	Aud. merchandise receipts..	"
N. F. Davis.....	Asst. aud. merch. receipts..	"
H. S. Maccubbin..	Asst. aud. merch. receipts..	"
L. A. Lambert....	Aud. coal and coke receipts.	"
W. B. Dudderar..	Asst. aud. coal & coke rec's.	"
C. H. Poumairat..	Auditor passenger receipts.	"
L. M. Grice.....	Asst. aud. pass. receipts....	"
J. F. Schutte.....	Auditor freight claims.....	"
C. G. Pollock.....	Auditor miscel. receipts....	"

TREASURY DEPARTMENT

P. C. Swein.....	General paymaster.....	Baltimore, Md.

ADJUSTMENT DIVISION

H. Gardner.....	Mech. eng. Adjustment Div.	Baltimore, Md.

VALUATION DEPARTMENT

H. B. Dick.....	Assistant valuation eng'r...	Baltimore, Md.

OPERATING DEPARTMENT

A. G. Sandman....	Mechanical engineer.....	Baltimore, Md.
J. H. Davis.....	Electrical engineer.....	"
I. J. Poole.....	Supervisor of shops.....	"
F. J. Pfahler.....	Sup'or loco. maintenance...	"
J. D. Clarke.....	Supt. transportation	"
G. D. Brooke.....	Supt. transportation	Cincinnati, Ohio.
C. W. Gorsuch...	Transportation assistant...	Pittsburgh, Pa.
F. J. Angier.....	Supt. timber preservation...	Baltimore, Md.
E. W. Day.....	Asst. supt. telegraph.....	"
E. T. Ambach....	Asst. supt. telegraph.....	Cincinnati, Ohio.
H. L. Denton....	Gen. superintendent police..	Baltimore, Md.

NEW YORK TERMINAL LINES

E. J. Hamner....	Superintendent	St. George, S. I.

EASTERN LINES

C. G. Martin.....	Asst. to general manager...	Baltimore, Md.
C. A. Gill.....	Supt. motive power.....	"
S. A. Jordan.....	Engr. maintenance of way..	"
E. T. Horn.....	Supervisor of terminals....	"

Maryland District

A. K. Galloway...	District master mechanic...	Baltimore, Md.
R. B. White.....	Supt. Baltimore division...	"
F. G. Hoskins....	Supt. terminal	"
J. W. Deneen....	Supt. Cumberland division..	Cumberland, Md.

West Virginia District

J. F. Bowden.....District master mechanic...Wheeling, W. Va.
C. W. Van Horn.Supt. Monongah division..Grafton, W. Va.
E. V. Smith.....Supt. Wheeling division....Wheeling, W. Va.
J. W. Root.....Supt. Ohio River division..Parkersburg,W.Va
W. Trapnell.....Supt. Charleston division...Weston, W. Va.

Pennsylvania District

G. A. Schmoll....District master mechanic...Pittsburgh, Pa.
T. J. Brady.....Supt. Connellsville division.Connellsville, Pa.
C. B. Gorsuch....Supt. Pittsburgh division...Pittsburgh, Pa.

WESTERN LINES

J. B. Carothers...Asst. to general manager...Cincinnati, Ohio.
E. B. Russell.....Asst. to general manager... "
W. Malthaner....Supt. of motive power..... "
F. J. Young.....Superintendent police..... "
E. G. Lane.....Engr. maintenance of way.. "

Northwest District

W. D. Johnson...District master mechanic...Cleveland, Ohio.
D. F. Stevens.....Supt. New Castle division..New CastleJct.,Pa.
H. B. Green.....Supt. Cleveland division...Cleveland, Ohio.
E. W. Hoffman...Supt. Chicago division.....Garrett, Ind.
S. U. Hooper.....Supt. Newark division.....Newark, Ohio.

Southwest District

G. R. Galloway...District master mechanic...Cincinnati, Ohio.
R. W. Brown.....Supt. Ohio division.....Chillicothe, Ohio.
J. H. Meyers.....Terminal superintendent....Cincinnati, Ohio.
A. A. Iams.....Supt. Indiana division.....Seymour, Ind.
C. G. Stevens.....Supt. Illinois division.....Flora, Ill.

Kentucky District. Sandy Valley & Elkhorn Railroad. Long Fork Railroad. Millers Creek Railroad.

H. R. Laughlin...Superintendent .....Jenkins, Ky.

ENGINEERING DEPARTMENT

H. A. Lane.....Chief engineer .....Baltimore, Md.
H. R. Talcott.....Asst. chief engineer..... "
W. S. Bouton....Engineer bridges ..... "
L. P. Kimball....Engineer buildings..... "
A. M. Kinsman...Engineer construction..... "
Paul Didier.....Principal assistant engineer.Pittsburgh, Pa.
J. T. Wilson.....Consulting engineer..... "
A. C. Clarke.....District engineer..... "
R. Mather .....District engineer.....Baltimore, Md.
A. H. Griffith....District engineer.....Cincinnati, Ohio.
C. H. Moran.....Real estate agent.....Baltimore, Md.
B. S. Mace.....Superintendent insurance... "

PURCHASING DEPARTMENT

E. W. Thornley..Assistant purchasing agent.Baltimore, Md.
C. H. Dyson.....Assistant fuel agent.....Cincinnati, Ohio.

PASSENGER DEPARTMENT

J. P. Dugan.....Gen. bag. and milk agent...Baltimore, Md.
H. B. Faroat.....Asst. gen. pass. agent..... "
J. P. Taggart.....Asst. gen. pass. agent.....Pittsburgh, Pa.
C. J. Proudfoot...Div. pass. agent.....Wheeling, W. Va.
J. B. Scott.....Gen. eastern pass. agent...New York, N. Y.
E. E. Baekey.....Division passenger agent... "
R. C. Haase.....Division passenger agent...Philadelphia, Pa.
H. H. Taggart....Division passenger agent...Baltimore, Md.
W. V. Shipley....Division passenger agent...Washington, D. C.
W. W. Picking...Division passenger agent...Cumberland, Md.
E. D. Ainslie.....Asst. gen. pass. agent.....St. Louis, Mo.
J. D. Strickenburg.Division passenger agent...Cleveland, Ohio.
B. E. White.....Division passenger agent...Columbus, Ohio.
G. F. Sheer.....Division passenger agent...Toledo, Ohio.
T. J. West.....Division passenger agent...Cincinnati, Ohio.
F. J. Parmelee....Division passenger agent...Louisville, Ky.
Theo. Heiland....Division passenger agent...Dayton, Ohio.
W. P. Townsend.Division passenger agent...Springfield, Ill.
P. C. Benedict...Division passenger agent...Chicago, Ill.

FREIGHT DEPARTMENT

W. L. Cromlish..Coal freight agent.....Pittsburgh, Pa.
C. H. Ashar.....Coal freight agent.....Cincinnati, Ohio.
J. A. Schuerman..Coal freight agent.....Cleveland, Ohio.
M. W. Pryor.....Asst. foreign freight agent.Baltimore, Md.
E. D. Curtis.....Asst. gen. live stock agent..Pittsburgh, Pa.
M. J. Bevans.....Division freight agent.....New York, N. Y.
S. D. Riddle.....Commercial freight agent... "
C. A. Schultz.....Commercial freight agent... "
J. H. Carroll, Jr.Asst. general freight agent..Philadelphia, Pa.
C. H. Pumphrey..Commercial freight agent... "
G. W. Bumpas....Commercial freight agent...Wilmington, Del.
Samuel House....Asst. general freight agent.Baltimore, Md.
A. J. Anderson...Asst. general freight agent. "
Geo. S. Harlan...Division freight agent..... "
Edward S. King..Commercial freight agent...Baltimore, Md.
F. L. Marshall, Jr.Commercial freight agent...Washington, D. C.
J. L. Hayes.....Division freight agent.....Cumberland, Md.
C. S. Roberts.....Asst. general freight agent.Pittsburgh, Pa.
J. C. Kimes.....Asst. general freight agent.Cleveland, Ohio.
C. M. Groninger..Commercial freight agent..Akron, Ohio.
W. W. Blakely...Division freight agent.....Pittsburgh, Pa.
W. E. Magill.....Commercial freight agent.. "
W. A. Eaton.....Division freight agent.....Uniontown, Pa.
A. L. Doggett....Division freight agent.....Youngstown, O.
F. M. Jordan.....Division freight agent.....Grafton, W. Va.
Samuel Strachan..Division freight agent.....Charleston, W.Va.
F. H. Fowler.....Division freight agent.....Parkersb'g, W. Va.
R. E. Barnhart...Commercial freight agent..Huntington,W.Va.
S. C. Williams...Commercial freight agent..Wheeling, W. Va.
S. T. McLaughlin.Asst. to freight traffic mgr..Cincinnati, Ohio.
J. D. Marney.....Asst. general freight agent.Louisville, Ky.
L. C. Smith.....Commercial freight agent.. "
C. H. Gomm.....Asst. general freight agent.Cincinnati, Ohio.
R. L. Galleher....Division freight agent..... "
F. T. Sturtevant..Commercial freight agent.. "
E. N. Kendall....Division freight agent.....Columbus, Ohio.
H. G. Settle.....Division freight agent.....Chillicothe, Ohio.
D. L. Ogg.....Commercial freight agent..Portsmouth, Ohio.
H. E. Warburton.Division freight agent.....Dayton, Ohio.
J. G. Fry.....Gen. Southw'rn frt. agent..St. Louis, Mo.
T. W. Lindsay....Division freight agent.....Vincennes, Ind.
W. C. McLaughlin.Asst. gen. freight agent....Chicago, Ill.
D. E. Sullivan....Division freight agent..... "
J. E. Melone.....Division freight agent.....Toledo, Ohio.
E. C. Law.....Commercial freight agent.. "

COMMERCIAL DEVELOPMENT DEPARTMENT

W. I. Bishop.....Industrial agent.....Baltimore, Md.
J. M. McDermott.Industrial agent.....Chicago, Ill.
G. C. Arnold.....Industrial agent.....Cincinnati, Ohio.
C. M. Gosnell....Industrial agent.....Pittsburgh, Pa.
G. P. Grimsley...Geologist .....Baltimore, Md.
P. S. Phenix.....Industrial survey agent.... "

CHICAGO GREAT WESTERN

The following appointments have been made on the Chicago Great Western, effective on April 1, in addition to those announced in the *Railway Age* of March 12, page 802:

William L. Derr.Land and tax commissioner.Chicago, Ill.
Sid. V. Royland..Supt. Western division....Clarion, Ia.
George W. Berry.Supt. Northern division...St. Paul, Minn.
Guy J. Congdon..Trainmaster North. div.... "
Albert E. Staup..Asst. to vice-president.....Chicago, Ill.

CHICAGO, ROCK ISLAND & PACIFIC

The following appointments have been made in the traffic department of the Chicago, Rock Island & Pacific, effective as noted:

M. T. McCraney.General agent (Mar. 10)..Pittsburgh, Pa.
J. Merrow, Jr..... " " (Mar. 22)..Cincinnati, Ohio.
G. W. Teare..... " " (Mar. 15)..Cleveland, "
E. R. Hines..... " " (Mar. 3)..Boston, Mass.
George P. Cave.. " " (Mar. 16)..Seattle, Wash.
V. M. Cluis..... " " (Mar. 16)..Atlanta, Ga.
C. H. Caswell.... " " (Mar. 1)..Chicago.
J. A. Roach.....Asst. gen. agent (Mar. 1).. "
E. A. Groves.....General agent (Mar. 1)..New Orleans, La.
F. W. Thompson. " " (Mar. 1)..San Francisco

CHICAGO & ALTON.

The executive personnel of the Chicago & Alton has been announced as follows:

Robt. S. Lovett...Chairman exec. comm.....New York
Robt. S. Walker..Vice-president ..... " "
James Williams..Secretary and treasurer... " "
W. G. Bierd.....President .....Chicago.
S. G. Lutz.....Vice-president, traffic..... "
A. P. Titus.....General manager..... "
H. E. R. Wood..Asst. sec. and asst. treas... "
E S. Benson.....Controller ..... "
Silas H. Strawn..General solicitor..... "
H. T. Douglas, Jr.Chief engineer..... "
J. F. Marshall....Purchasing agent..... "
J. H. Howard...General claims agent..... "
Geo. J. Charlton.Pass. traffic manager..... "
C. W. Galligan...Freight traffic manager.... "
W. C. Steffa.....Supt. of car service..... "
G. W. Seidel.....Supt of m. p. & equip....Bloomington, Ill.
W. H. Penrith...General superintendent.... " "

DETROIT & MACKINAC

The following is the new organization of the Detroit & Mackinac, effective March 1:

H. K. McHarg	President	New York.
J. McNeil	Secretary and treasurer	New York.
J. D. Hawks	V.-P. and gen. manager	Detroit, Mich.
H. K. McHarg, Jr.	Asst. to v.-p. & gen. mgr.	East Tawas, Mich.
C. W. Luce	General superintendent	"
John Mulreny	Master mechanic	"
C. A. Pinkerton	Supt. of car service	"
A. Wilkins	Trainmaster	"
J. V. McKeon	Chief engineer	East Tawas, Mich.
E. H. Gilman	Land agent	Alpena, Mich.
J. McNamara	General counsel	"
P. Richardson	Asst. treas. and pur. agent.	"
C. E. Glass	Auditor	"
G. F. Townsend	Assistant auditor	East Tawas, Mich.
J. Halligan	Storekeeper	Detroit, Mich.
G. L. Wakeman	Gen. frt. and pass. agent	Bay City, Mich.
A. S. Matteson	Freight claim agent	"

DULUTH, SOUTH SHORE & ATLANTIC

The following is the new organization of the Duluth, South Shore & Atlantic and the Mineral Range:

E. Pennington	President	Minneapolis.
G. R. Huntington	General manager	"
W. L. Martin	Traffic manager	"
C. W. Gardner	Comptroller	"
A. E. Delf	Assistant comptroller	Marquette, Mich.
A E. Miller	General solicitor	" "
G. W. Webster	Secretary	Minneapolis.
W. J. Ellison	Treasurer	Marquette, Mich.
T. A. Foque	Gen. mechanical supt.	Minneapolis.
E. A. Whitman	Chief engineer	"
E. T. Stone	Purchasing agent	"
W. H. Schutt	Real estate agent	"
W. R. Callaway	Pass. traffic manager	"
H. M. Lewis	Gen. passenger agent	"
Jas. Maney	Asst. gen. passenger agent.	Duluth.
S. R. Lewis	General freight agent	"
R. O. Hambly	Asst. gen. freight agent	"
Jas. Robertson	Asst. gen. frt. & pass agt.	Houghton.
O. A. Roedell	General baggage agent	Minneapolis.

ILLINOIS CENTRAL

The following appointments have been made in the controller's office of the Illinois Central and the Yazoo & Mississippi Valley in addition to other appointments announced in the *Railway Age* of March 5, page 742:

B. D. Bristol	Assistant controller	Chicago, Ill.
J. F. Shepherd	Auditor of freight receipts.	"
L. C. Esschen	Auditor of pass. receipts.	"
J. J. Crane	Asst. aud. of pass. receipts.	"
L. B. Butts	Aud. of station accts.	"
J. M. O'Day	Car accountant	"
J. R. Breidenstein	Freight claim agent	"
R. E. Kimbell	Aud. of misc. accounts	"
J. F. Dartt	Aud. of disbursements	"
A. P. McComb	Asst. aud. of disbursements.	"

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE

The following gives a portion of the new organization of the Minneapolis, St. Paul & Sault Ste. Marie, effective March 1:

E. Pennington	President	Minneapolis.
G. R. Huntington	Vice-pres. and gen. mgr.	"
W. L. Martin	Vice-pres.—traffic	"
C. F. Clement	Treasurer	"
H. N. Paist	Assistant Treasurer	"

ACCOUNTING DEPARTMENT

C. W. Gardner	Comptroller	Minneapolis.
D. J. Bond	Assistant comptroller	"
B. Newhouse	" "	"
J. F. Heberle	Assistant auditor	"
R. Brownlee	" "	"
B. E. McCune	" "	"
A. E. Hancock	Auditor disbursements	"
F. E. Dooley	Aud. capital expenditures	"
R. A. Mueller	Freight auditor	"
L. E. Hodson	Assistant freight auditor	"
A. A. Smith	Ticket auditor	"
C. E. Leatsch	Assistant ticket auditor	"

LEGAL DEPARTMENT

H. B. Dike	General counsel	Minneapolis.
John L. Erdall	General solicitor	"
Geo. A. Kingsley	General attorney	"
A. H. Lossow	Commerce counsel	Minneapolis.
W. A. Hayes	Gen. attorney, Wisconsin	Milwaukee, Wis.
J. L. McInerney	Gen. Attorney, Illinois	"
H. G. Richardson	Claims attorney	Minneapolis.
J. H. Rishmiller	Chief surgeon	"
A. E. Hodson	Freight claim agent	"
J. E. Westlake	Right of way agent	"
C. G. Sturtevant	Tax commissioner	"
C. B. Reinardy	Chief special agent	"

OPERATING DEPARTMENT

W. C. Ranous	General superintendent	Minneapolis.
C. M. Winter	Supt. So. dist. Ohio div.	Fond du Lac, Wis.
F. W. Urbahns	Assistant superintendent	Chicago.

The following appointments have been made in the traffic department of the Minneapolis, St. Paul & Sault Ste. Marie, effective on March 10:

FREIGHT DEPARTMENT

T. E. Sands	Freight traffic manager	Minneapolis, Minn.
E. G. Clark	General freight agent	"
C. V. Gallagher	Asst. gen. freight agent	Chicago.
J. H. Rees	Asst. gen. freight agent	Minneapolis, Minn.
A. L. Preston	Asst. gen. freight agent	St. Paul, Minn.

PASSENGER DEPARTMENT

W. R. Callaway	Pass. traffic manager	Minneapolis, Minn.
H. M. Lewis	General pass. agent	"
J. C. Pond	Asst. gen. pass. agent	Chicago.
Jas. Maney	Asst. gen. pass. agent	Duluth, Minn.
O. A. Roedell	General baggage agent	Minneapolis, Minn.
E. G. Chesbrough	Gen. agent, pass. dept.	Atlanta, Ga.
L. R. Robinson	General agent	Boston, Mass.
H. W. Hobbs	New England agent	"
L. R. Hart	General agent, pass. dept.	"
C. S. Richardson	District freight agent	Buffalo, N. Y.
Geo. O. Walton	General agent, pass. dept.	"
C. V. Gallagher	Asst. gen. freight agent	Chicago.
W.A.Kittermaster	General agent, freight dept.	"
Thos. J. Wall	General agent, pass. dept.	"
E. C. Frost	Div. frt. and pass. agent	Chippewa F'ls,Wis.
C. K. Landes	District freight agent	Cincinnati, Ohio.
M. E. Malone	General agent, pass. dept.	"
G. Hiam	Dis. freight agent	Cleveland, Ohio.
G. B. Burpee	General agent, pass. dept.	"
G. C. Cochlan	District freight agent	Detroit, Mich.
M. G. Murphy	General agent, pass. dept.	"
G. A. Sherwood	General agent	Duluth, Minn.
L. C. Jack	District freight agent	Kansas City, Mo.
R. C. Norris	Traveling pass. agent	"
A. A. Polhamus	General agent, pass. dept.	Los Angeles, Cal.
C. P. McGhee	Traveling freight agent	"
J. A. Millington	General agent	Milwaukee, Wis.
A. G. G. Lauder	District freight agent	"
F. T. Sansom	City passenger agent	"
J. C. Carey	District freight agent	Memphis, Tenn.
H. M. Weston	Commercial agent	Minneapolis, Minn.
Geo. T. Huey	General agent	"
C. F. Ronnan	Commercial agent	"
G. W. Hawes	General agent	"
J. P. Gehrey	General agent, pass. dept.	"
A. C. Wilson	Div. frt. and pass. agent	Neenah, Wis.
M. S. Throne	Gen. agent, freight dept.	New York, N. Y.
F. R. Perry	General agent, pass. dept.	"
F. T. Goodman	District freight agent	Philadelphia, Pa.
R. C. Clayton	City passenger agent	"
Robt. Main	District freight agent	Pittsburgh, Pa.
C. L. Williams	General agent, pass. dept.	"
O. H. Becker	District freight agent	Portland, Ore.
E. E. Penn	General agent, pass. dept.	"
W. M. Porteous	District freight agent	St. Louis, Mo.
E. L. Sheehan	General agent pass. dept.	"
A. L. Preston	Asst. gen. freight agent	St. Paul, Minn.
B. E. Smeed	General agent, pass. dept.	"
W. W. Smith	District freight agent	San Francisco, Cal.
F. L. Nason	General agent, pass. dept.	"
J. W. Draper	District freight agent	Seattle, Wash.
E. F. L. Sturdee	General agent, pass. dept.	"
E. L. Cardle	Tr. mgr., Spokane Inter'al.	Spokane, Wash.
J. C. Peterson	General agent	Winnipeg,Man.,C'a

TEXAS & PACIFIC

The following officers have been appointed on the Texas Pacific, in addition to those announced in the *Railway Age* of March 5 (page 751), and of March 26 (page 1080):

O. F. Ellington	General claim agent	Dallas, Tex.
H. S. Buescher	Freight claim agent	" "
Z. J. Reese	General baggage agent	" "